NP-8530

SERVICE MANUAL

(for 115v)

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Canon

NOV. 1990

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Use of this manual should be strictly supervised to avoid disclosure of confidential information.

Prepared by

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PREFACE

This SERVICE MANUAL is intended to provide the service technician with a basic knowledge of the plain paper copier NP-8530 and has been compiled to serve as a handy reference for his work in the field.

The NP-8530 is designed to enable full automation of copying work and may be configured with the following system options:

1. Sorter
2. RDF. Sub Feeder

For discussions of the above system options, see the service manuals that come with them.

In CHAPTER 1 "GENERAL DESCRIPTION," a brief discussion of the NP-8530's features, diagrams of its parts, and an explanation of its operation are given.
CHAPTER 2 "COPYING PROCESS" deals with the inner workings of the NP-8530 which are associated with the generation of copies.
CHAPTER 3 "OPERATIONS AND TIMING" explains how the NP-8530's electrical and mechanical systems are related to each other with respect to functions and timing of operations.
In CHAPTER 4 "MECHANICAL SYSTEM," the NP-8530's mechanical system is discussed as to its operation, disassembly, reassembly, and adjustment.
CHAPTER 5 "INSTALLATION" gives step-by-step instructions for installing the NP-8530 together with checks to make for each step.
CHAPTER 6 "MAINTENANCE AND SERVICING" contains tables of replacement parts and consumables.

In addition to the above chapters, this SERVICE MANUAL contains a set of appendixes consisting of a general timing chart and general circuit diagrams.

A separate document entitled SERVICE HANDBOOK is also available for troubleshooting problems in the NP-8530.

Note:

The contents of this manual may be updated from time to time to reflect improvements rendered to the product; a Service Information Bulletin will be issued as necessary to cover major changes.

All service technicians are expected to be thoroughly familiar with the information contained in this manual, SERVICE HANDBOOK, and Service Information Bulletins for quick response to the user's needs.

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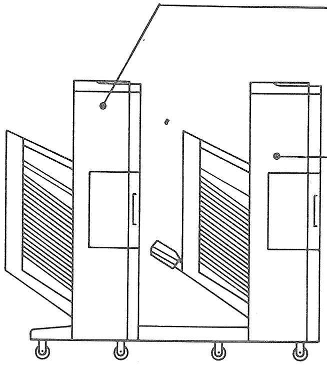
System Configuration

The NP-8530 may take the following system configuration; components with an asterisk (*) are available as options.



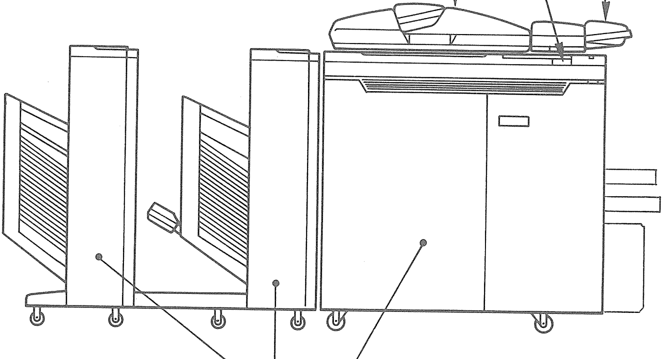
Stapler Sorter-A1* (two-sorter configuration) Using two sorters enables sorting the copies up to 40 groups, stapling a maximum of 50 copies each.

Stapler Sorter-A1*
In addition to sorting, it is capable of automatically stapling the sorted copies; up to 20 groups, 50 each.

Control Card V*
The card helps control copy volume.

Sub Feeder-A1*
When combined with the RDF, a total of 100 originals (64 g/m^2) may be fed automatically (double feeder mode). If originals are set in the Sub Feeder while copying operation is taking place and the consecutive mode is selected, the originals therein will be copied automatically as soon as the ongoing copy run is over.

RDF
(automatic two-sided original feeder)
It feeds and places sheet originals one by one to the copyboard for copying; up to 50 originals of 64 g/m^2.



Sorter-B1*
(two-sorter configuration)
Using two sorters enables sorting/grouping of copies; up to 40 groups.

Sorter-B1*
It sorts/groups the copies automatically; up to 20 groups.

Duplexing Unit (automatic two sided/overlay unit)
When the two-sided or overlay copy mode is selected, it controls the copy paper so that both sides of it may be processed or one side of it may be processed twice.

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CHAPTER 1

GENERAL DESCRIPTION

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I. FEATURES

1 A mere 2.5-second wait brings out the first copy, followed by as many as 83 copies (Letter) per minute.

- High-speed copiers must be fast from beginning to end of its operation; the copier turns out the first copy in no more than 2.5 seconds.
- The copier can make 83 copies (Letter) every minute; 55 copies if of legal.
- The use of an RDF will not decrease the number of copies made per minute; as many as 83 Letter-size copies may still be made of a single original.

2 The amorphous silicon (A-Si) photosensitive drum ensures high durability and crisp images.

- The A-Si photosensitive drum promises high-quality images even for copies made in the high-speed mode.
- Images are rendered high stability thanks to Canon's unique single-component projection development technology.
- In addition, the automatic exposure (AE) mechanism and photo mode help make copies of newspapers, blue prints, and photos at the optimum density.

3 The Stapler Sorter, RDF, and Sub Feeder are provided as standard equipment for fully automated copying work.

- The RDF is standard to enable automatic reversal of originals and automatic selection of paper size and reproduction ratio.
- When used in combination, the RDF and Sub Feeder operate one after the other automatically using the copy modes stored in advance.
- The RDF and the Sub Feeder can each hold as many as 50 originals*; this way, a total of 100 originals may be copied by a single key operation.
  *25 originals of 11"x17" or LGL; the Sub Feeder holds Letter originals only.
- With the Stapler Sorter (20-bin), up to 50 copies may be stapled.
- Further, the built-in duplexing mechanism enables automatic reproduction of 50 two-sided/overlay copies continuously for fully automated large volume copying work.

II. SPECIFICATIONS

A. TYPE

Body	Console
Copyboard	Fixed
Light source	Halogen lamp (184 W for 115V)
Lens	Zoom
Photosensitive medium	Amorphous silicon

B. REPRODUCTION SYSTEM

Copying		Indirect electrostatic
Charging		Corona
Exposure		Slit aperture (scanning)
Copy density control		Automatic or Manual
Development		Dry (single-component toner projection)
Pick-up	Automatic	Cassettes (2 holders) ; Paper deck
	Manual	Manual feed tray
Transfer		Corona
Separation		Corona (electrostatic)
Cleaning		Blade
Fixing		Heat rollers (1250 W + 350 W)

C. PERFORMANCE

Type of original		Sheet, Book, 3-D objects (2 kg/4.4 lb.. max.)
Size of original		LDG (11"X17")
Reproduction ratios	DIRECT	1 : 1 (±0.5%)
		115 V
	REDUCTION I	1 : 0.647 (±1.0%)
	REDUCTION II	1 : 0.733 (±1.0%)
	REDUCTION III	1 : 0.786 (±1.0%)
	ENLARGEMENT I	1 : 1.420 (±1.0%)
	ENLARGEMENT II	1 : 1.294 (±1.0%)
	ENLARGEMENT III	1 : 1.214 (±1.0%)
	ZOOM	1 : 0.640 to 1.420 (±1.0%)
Warm-up time		5 min (20°C/68°F)
First copy		2.5 sec (LTR; non-AE, pick-up from lower cassette)
Continuous		999 copies (max.)
Copy size		LDG (11"X17"), max.; STMT-R (5.5"X8.5"), min.
Type of copy paper	Cassette feeding	Plain paper (64 to 80 g/m^2), Tracing paper*, Colored paper (LGL, LTR)*
	Manual feeding	Plain paper (64 to 80 g/m^2), Tracing paper*, OHP film*, Postcard* (as recommended by Canon), Label sheet (LTR)*, Thick paper (81 to 128 g/m^2)*, Colored paper (LGL, LTR)*
Two-sided copying	Automatic	Plain paper (64 to 80 g/m^2), Colored paper (LGL, LTR)*
Overlay copying	Automatic	Plain paper (64 to 80 g/m^2)*, Colored paper (LGL, LTR)*

*May be used; however, may have low feeding performance.

Cassette	Claw	Yes
	Regular	27 mm / 1.06 in deep (about 250 sheets of 80 g/m^2)
	Universal	20 mm / 0.97 in deep (about 200 sheets of 80 g/m^2)
Copy tray		250 copies (approx.; A3/LDG, 80 g/m^2)
Non-image width	Leading edge	4.0 ±1.0 mm/0.16 ±0.04 in. (DIRECT); 4.0 ±1.5 mm/0.16 ±0.06 in. (ENLARGEMENT, REDUCTION, Overlay, Two-sided)
	Left/Right (1st side)	2.5 ±1.5 mm/0.1 ±0.06 in. (w/ standard frame erasing); 0 ±1.5 mm/0 ±0.06 in. (w/o standard frame erasing)
	Left/Right (2nd side)	2.5 ±2.0 mm/0.1 ±0.08 in. (w/ standard frame erasing); 0 ±2.0 mm/0 ±0.06 in. (w/o standard frame erasing)
Auto Clear		Yes. (2 min, standard; may be varied between 0 and 60 min in 1-min increment)
Auto Shut-off		Yes. (2 hr standard; may be varied between 0 and 480 min in 10-min increment)
Options		Stapler Sorter-A1, Sorter-B1, Control Card V

D. OTHERS

Operating environment	Temperature	15° to 30 °C/59° to 86°F
	Humidity	5% to 80%
	Atmospheric pressure	0.6 to 1 atm.
Power source	115V 60Hz	Machine Serial Number
		CYB XXXXX
Power consumption	Max.	2.0 kW or less
	Standby	0.239 kw (reference)
	Continuous	2.223 kw (reference)
Noise	Copying	65 dB or less (1 m from machine)
	Standby	40 dB or less (1 m from machine)
Ozone		0.1 ppm or less (average over 8 hr)

Dimensions (including RF, PF unit)	Width	1145 mm/45 in.
	Depth	690 mm/27.2 in.
	Height	1095 mm/43.1 in.
Weight (including RF, PF unit)		205 kg/451 lb
Consumables	Copy paper	Keep wrapped to protect against humidity.
	Toner	Keep away from sun; keep under 40°C, 80%.

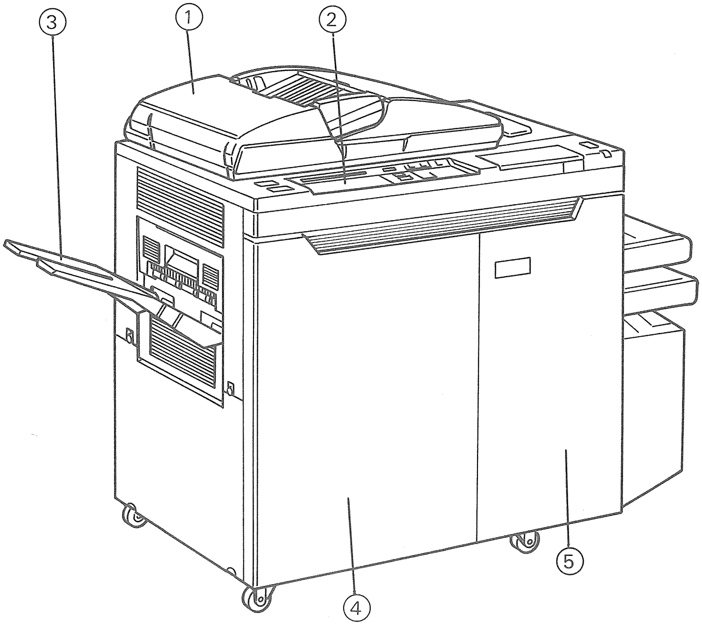
Reproduction mode		Size	Copy size	Speed (copies/min)
DIRECT		Ledger (11" x 17")	Ledger	46
		Legal	Legal	55
		Letter	Letter	83
REDUCE	I	Ledger → Letter	Letter - R	44
	II	Ledger → Legal	Legal	35
	III	Legal → Letter	Letter - R	44
ENLARGE	I	Letter → Ledger	Ledger	44
	II	Legal → Ledger	Ledger	44

Table 1-1 Copying Speed (copier only)

Specifications are subject to change without notice.

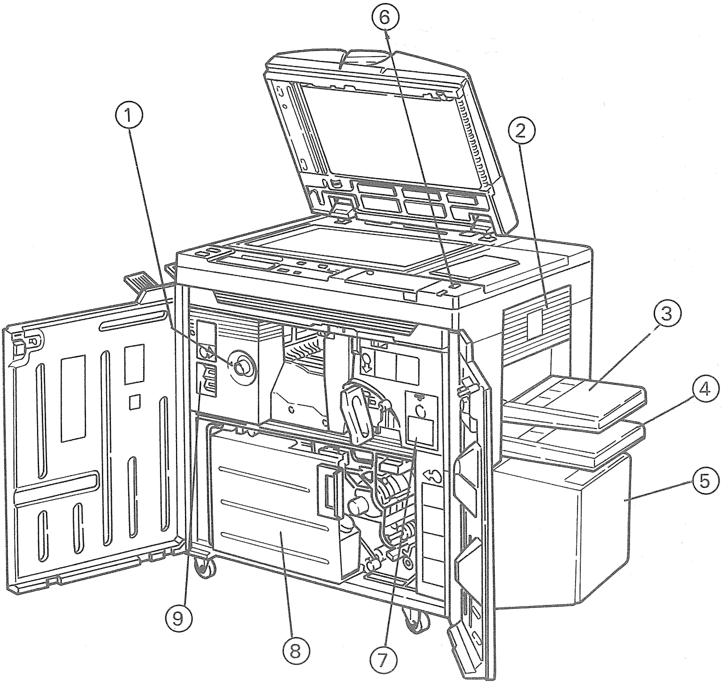
III. NAMES OF PARTS

A. EXTERNAL VIEW



① RDF	③ Copy tray	⑤ Right front door
② Control panel	④ Left front door	

Figure 1-1

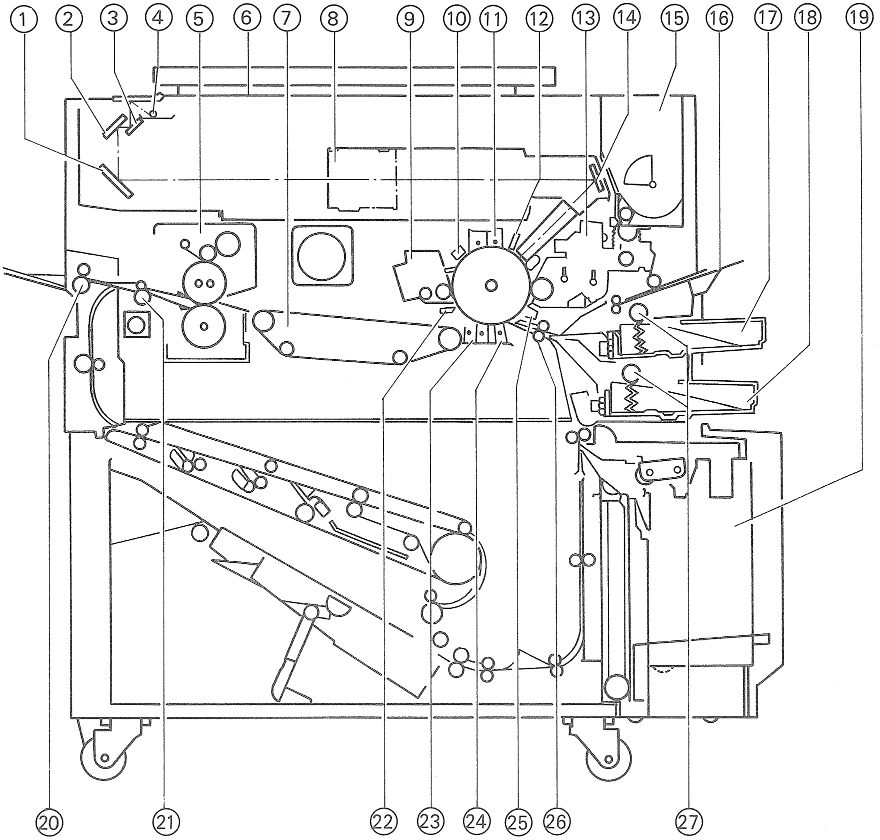


① Fixing assembly knob ④ Middle cassette ⑦ Jam location indicator
② Manual feeder tray ⑤ Paper deck ⑧ Waste toner receptacle
③ Upper cassette ⑥ Power switch ⑨ Total copy counter

Figure 1-2

B. CROSS SECTION

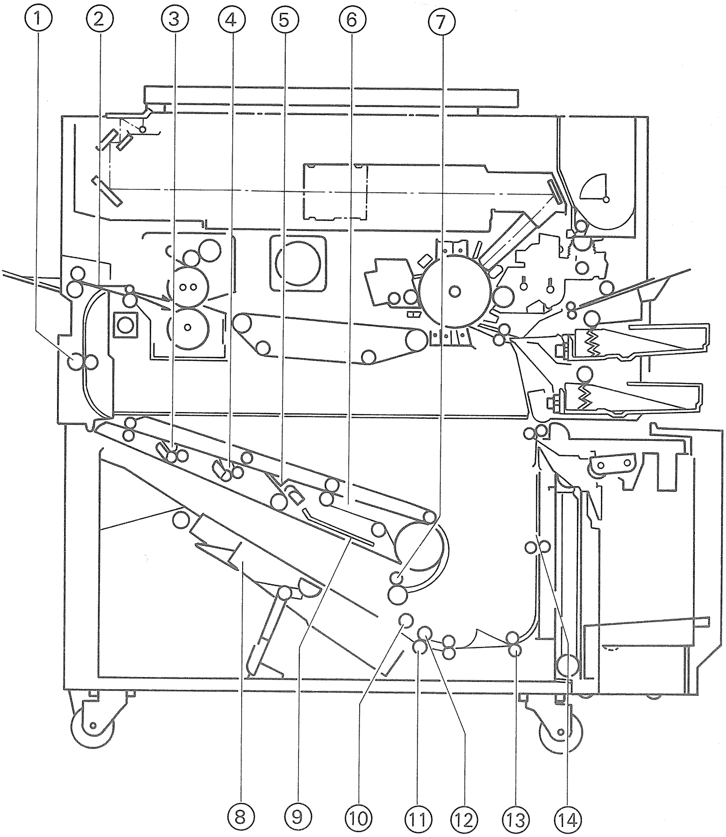
1. Cross Section of Copier



① Mirror 3
② Mirror 2
③ Mirror 1
④ Scanning lamp
⑤ Fixing assembly
⑥ Copyboard glass
⑦ Feeder assembly
⑧ Lens
⑨ Drum cleaning unit
⑩ Pre-exposure lamp
⑪ Primary corona assembly
⑫ Blank exposure lamp
⑬ Developing assembly
⑭ Mirror 4
⑮ Hopper unit
⑯ Manual feed pick-up unit
⑰ Upper cassette
⑱ Middle cassette
⑲ Paper deck
⑳ Delivery rollers
㉑ Delivery intermediate roller
㉒ Separation claws
㉓ Separation corona assembly
㉔ Transfer corona assembly
㉕ Pre-transfer corona assembly
㉖ Registration rollers
㉗ Pick-up rollers

Figure 1-3

2. Cross Section of Duplexing Unit



① Delivery/feeder assembly	⑥ Feed belt assembly	⑪ Separation roller
② Deflector 1	⑦ Two-sided delivery rollers	⑫ Feed roller
③ Deflector L	⑧ Holding tray	⑬ Two-sided copy feed roller
④ Deflector M	⑨ Holding tray paper guide	⑭ Vertical feeder assembly
⑤ Deflector S	⑩ Pick-up roller	

Figure 1-4

IV. OPERATION

A. CONTROL PANEL

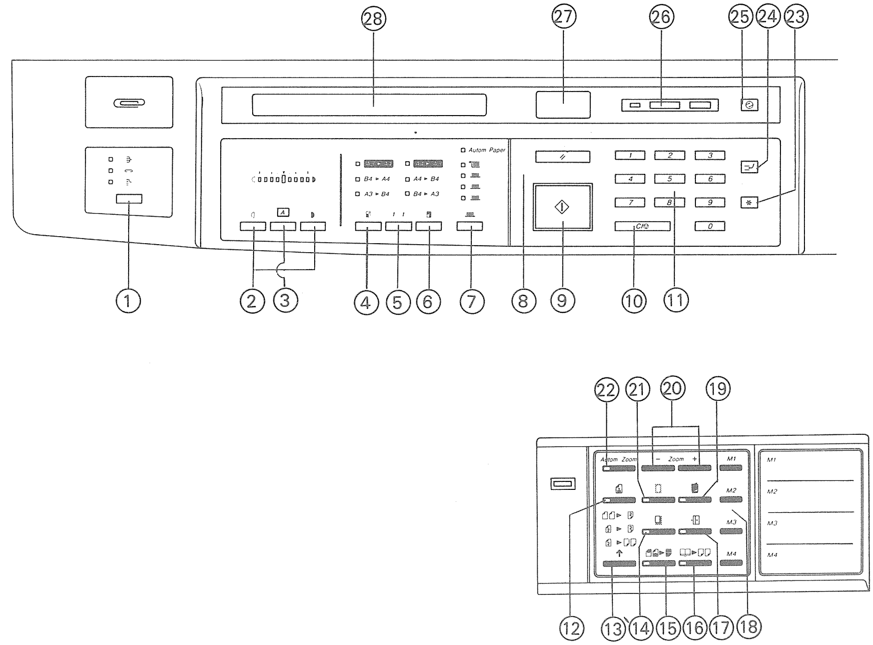

㉘
㉗
㉖
㉕㉔㉓
Autom Paper
B4 ▸ A4
A4 ▸ B4
A3 ▸ B4
B4 ▸ A3
1 1
C/⊘
1
2
3
4
5
6
7
8
9
0
①
②③
④⑤⑥
⑦
⑧
⑨
⑩
⑪
㉒㉑⑳
⑲
Autom Zoom
– Zoom +
M1
M2
M3
M4
⑫
⑬⑭⑮⑯⑰⑱

Figure 1-5

① SORT/GROUP/STAPLE key
② MANUAL DENSITY key
③ AUTOMATIC DENSITY key
④ REDUCTION key
⑤ DIRECT key
⑥ ENLARGEMENT key
⑦ CASSETTE SELECTION key
⑧ RESET key*
*The standard modes
are as follows:
- Copy count 1
- DIRECT
- Lower cassette

⑨ COPY START key
⑩ CLEAR/STOP key
⑪ INPUT keypad
⑫ PHOTO mode key
⑬ TWO-SIDED mode key
⑭ ORIGINAL FRAME ERASING mode key
⑮ OVERLAY mode key
⑯ TWO-PAGE SEPARATION mode key
⑰ MARGIN mode key
⑱ COPY MODE MEMORY key
⑲ COVER mode key
⑳ VARIABLE REPRODUCTION mode key
㉑ SHEET FRAME ERASING mode key
㉒ AUTOMATIC REPRODUCTION mode key
㉓ ASTERISK key
㉔ INTERRUPTION mode key
㉕ STANDBY mode key*
*Lights when in standby mode;
flashes when in auto shutoff mode.
㉖ CONSECUTIVE mode key
㉗ COPY COUNT display
㉘ MESSAGE display

B. MAKING COPIES

1) Set the power switch to '|'.

① If the temperature of the fixing assembly is below the specified value, the WAIT indicator glows red.
② If the temperature of the fixing assembly is the specified value or more, the WAIT indicator glows green.
③ Normally, the wait time is five minutes (20°C/68°F).

2) Set the originals on the original tray of the RDF; or, lift the RDF, and set the original face down, keeping it against the size index.

3) Press the DIRECT, REDUCTION, ENLARGEMENT or VARIABLE REPRODUCTION mode key as desired.

4) Select the cassette holder that holds the desired cassette (paper).

① Otherwise, set paper on the manual feed tray.

5) Press the MANUAL DENSITY key to adjust to suit the density of the original, if desired.

① Press DARK for a darker copy, or LIGHT for a lighter copy; the LEDs toggle to indicate the density.

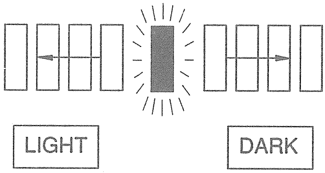


Figure 1-6

6) Enter the number of copies to make (1 to 999) using the input keypad, and check the number on the COPY COUNT display.

① If the indication is wrong or to correct a mistake, press the CLEAR/COPY STOP key, and start over.

7) Press the COPY START key.

① The originals set on the original tray of the RDF will be picked up automatically, and copying operation will start.
② Copies will be made in the specified number.
③ The copying modes cannot be changed between the first and last copies; the CLEAR/STOP key and MANUAL DENSITY key, however, remain enabled.
④ It is possible to change from automatic to manual density control between the first and last copies, but not the other way around.

Note:

If the copies are too dark or too light in the AE mode, press the MANUAL DENSITY keys as necessary until the desired density is obtained; use the reading indicated for reference.

⑤ To stop the operation while in the continuous copying mode, press the CLEAR/COPY STOP key; the operation will stop as soon as the on-going copy run is completed.
⑥ When the copying operation is completed, the COPY COUNT indicator returns to the initial count. The ADD PAPER indicator will go ON if the paper runs out; if the copying operation was suspended because of such a condition, the remaining copies will be made automatically when paper is added and the COPY START key is pressed.

⑦ If a jam occurs during a copy run, the operation will stop while indicating the presence of a jam on the MESSAGE display.
The COPY COUNT indicator will show the remaining number of copies as soon as the jam is cleared.

⑧ About two minutes after copying operation or any key operation, the copier will return to its standard modes. (This Auto Clear time may be changed.)

C. PRE-HEAT MODE

If the PRE-HEAT key is pressed during standby, the copier will be in the pre-heat mode, and all indicators on the control panel except the pre-heat mode indicator will go OFF.

① No indicators will respond to a press on any keys on the control panel except the PRE-HEAT key.

⑦ A second press on the PRE-HEAT key de-activates the pre-heat mode.

⑧ The pre-heat mode does not affect the temperature control mechanism of the fixing assembly; it merely keeps the indicators on the control panel OFF. (When the PRE-HEAT indicator is ON.)

D. MARGIN MODE

A press on the MARGIN mode key produces copies with margins for binding.

① In this mode, the right side of the copy will have a margin of x mm (10, 15, 20) wide, as specified in the asterisk mode.

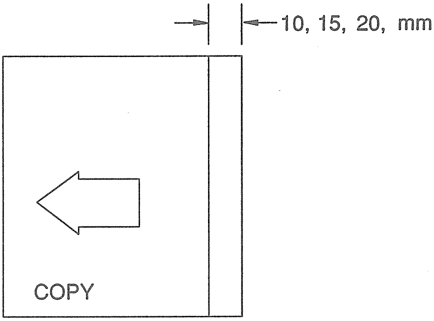


Figure 1-7

E. ORIGINAL FRAME ERASING MODE

A press on the ORIGINAL FRAME ERASING key blanks out four sides of the original, about 8.5 mm wide.

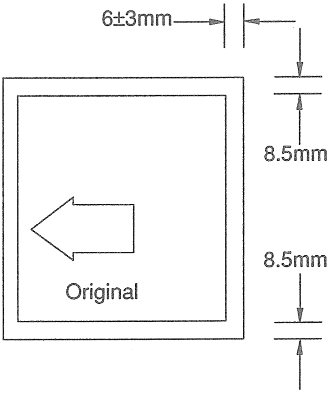


Figure 1-8

F. SHEET FRAME ERASING MODE

A press on the SHEET FRAME ERASING mode key produces copies with margins around their four sides, about 8.5 mm.

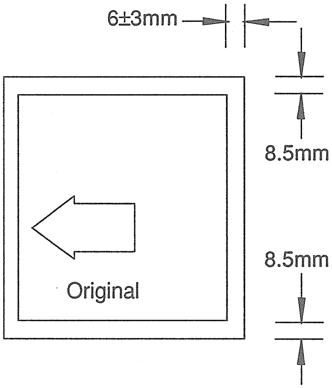


Figure 1-9

G. TWO-SIDED COPY MODE

1. Automatic Two-Sided Copy Mode

A press on the TWO-SIDED COPY mode key produces two-sided copies; the copies may be either of the following two types:

① One-Sided Originals to Two-Sided Copy
- Use the RDF to eliminate the need for replacing the originals.
- Press the TWO-PAGE SEPARATION mode key to make two-page separation/two-sided copies.

② Two-Sided Original to Two-Sided Copy

H. OVERLAY COPY MODE

1. Automatic Overlay Copy Mode

① Press the OVERLAY COPY mode key to make overlay copies.

② Press the TWO-PAGE SEPARATION key to make two-page separation/overlay copies.

I. MANUAL FEEDING

Operate as follows when using copy paper of a size or type different from that in the cassette, thereby eliminating the inconvenience of changing cassettes.

1) Select the desired reproduction ratio.
2) Press the MANUAL DENSITY key to suit the original if manual adjustment of the density is desired.
3) Open the manual feed tray.
   Opening the tray automatically selects the manual feed mode.
4) Insert copy paper along the guide plate on the manual feed tray.
   Copying operation starts upon insertion of paper.

Note:

Paper in sizes between A3/11"x17" and B5/mini may be fed manually.

J. AUTOMATIC PAPER SELECTION MODE

The automatic paper selection mode is effective only when the RDF is used

In this mode, the copier automatically selects the cassette most suited to the size of the original and the current reproduction ratio.

If no such cassette is available, the copier selects the cassette with paper that can cover the image of the original most and indicates the cassette it has selected on the MESSAGE display.

A press on the COPY START key will start copying operation; to stop it, press the CLEAR/STOP key.

K. AUTOMATIC REPRODUCTION RATIO MODE

The automatic reproduction ratio mode is effective only when the RDF is used.

In this mode, the copier selects the best reproduction ratio to suit the size of the original and the copy paper (cassette).

The size of a non-standard size original will be converted to one of the standard size originals; as a result, the reproduction will be at one of the standard reproduction ratios.

L. INTERRUPTION MODE

Press the INTERRUPTION mode key to interrupt any on-going copying operation to make a copy of a different original.

1) Press the INTERRUPTION mode key to activate the interruption mode; make sure of the following:

① No more than one copy will be made.

② The automatic paper selection mode will not be used.

③ The RDF will not be used.

④ The consecutive mode will not be used.

M. CONSECUTIVE MODE

If the copier is equipped with a sub feeder, make use of the consecutive mode; set the originals in the sub feeder, and set the consecutive mode to start copying the originals automatically right after copies are made from the RDF.

1) Press the CONSECUTIVE (ON/OFF) mode key, and set the desired copy modes; the CONSECUTIVE mode lamp will start to flash.

2) Press the CONSECUTIVE setting key to store the modes; the CONSECUTIVE mode lamp remains ON.

① The consecutive mode may be cleared by pressing the CONSECUTIVE (ON/OFF) mode key; the CONSECUTIVE mode lamp will go OFF.

N. ASTERISK MODE (USER MODE)

The copier's asterisk mode allows the user to choose his or her own settings.

Key operation	Description
⧆→1→⧆	Use it to change the binding margin.
⧆→2→⧆	Use it to set the original frame erasing width.
⧆→3→⧆	Use it to calculate a reproduction ratio.
⧆→4→⧆	Use it to copy originals of mixed sizes.
⧆→5→⧆	Use it to set the Auto Clear time.
⧆→6→⧆	Use it to clean the corona wires.
⧆→7→⧆	Use it to set the original count mode.
⧆→8→⧆	Use it to set the auto cassette change mechanism.
⧆→M→⧆	Use it to set the copy mode memory.

Table 1-2 Table of Asterisk Modes

1. Changing the Binding Margin

The margin may be 10, 15, or 20 mm in width.

1) Press ⧆→1⃞→⧆ in succession.
2) Enter '1', '2', or '3' using the input keypad, and press the ⧆.
- To select 15 mm, enter '2'.

```
Margin = 20mm stored
```

2. Setting the Original Frame Erasing Width

1) Press ⧆→2⃞→⧆.
2) Press the VARIABLE REPRODUCTION ratio mode key (+ or -) to select the desired size.
- Select 'A4', for example.

```
Frame erasing - A4                <+,-><⧆>
```

3) Press ⧆ to enter the mode.

3. Calculating a Reproduction Ratio

Enter the size of the original and the desired size of the copy; the copier will automatically calculate the best reproduction ratio.

1) Press ⧆→3⃞→⧆.
2) Enter the size of the original using the input keypad, and press ⧆.
- Select '250', for example.

```
Enter length - original 250       <0-9><⧆>
```

3) Enter the desired size using the input keypad.
- Enter '200', for example.

```
Enter length—copy 200             <0-9><⧆>
```

4) Press the ⧆.
- The copier executes calculation; 200 ÷ 250 = 0.8, selecting a 80% reproduction ratio.

```
Ratio = 80%
```

4. Mixing Originals of Different Sizes

Use this mode to make use of the auto paper selection and auto reproduction ratio modes while using the RDF loaded with originals of different sizes.

The copying speed, however, may slow down.

> **Note:**
>
> The originals must be of the same breadthwise length (A4 and A3, for example).

1) Press ⧆→4⃞→⧆.
2) Enter '1' or '0' using the input keypad.
- Enter '1', for example, before using originals of mixed sizes.

```
Yes = 1 No = 0                    <0,1><⧆>
```

3) Press ⧆ to store the setting.
- Press the RESET key or switch the power OFF to de-activate the mode.

5. Setting the Auto Clear Time

Set the Auto Clear time between one and sixty minutes in one-minute increment. If set to '0', the mode will be de-activated.

1) Press ⧆→5→⧆.
2) Enter the desired Auto Clear time using the input keypad.
- Enter '6', for example.

```
Auto-reset time = 6 min          <0-9><⧆>
```

3) Press ⧆ to store the setting.

6. Cleaning the Corona Wires

Make use of the mode to clean the primary, pre-transfer, transfer, and separation corona wires automatically.

1) Press ⧆→6→⧆.
2) Press ⧆ to execute cleaning (60 min, approx.).

The mode will be cleared automatically after cleaning.

7. Setting the Automatic Original Count Mode

Normally, the originals set in the RDF are counted before making two-sided copies of one-sided originals; use this mode to de-activate the mechanism.

1) Press ⧆→7→⧆.
2) Enter '1' or '0' using the input keypad.
- Enter '0', for example, to de-activate the mechanism.
3) Press ⧆.

Note:

When two-sided copies are made without the count mechanism, the first original (if of an odd number of originals) will be copied on the second side of the copy paper.

8. Setting the Auto Cassette Change Mode

The copier switches over cassette holders if the current cassette runs out of paper in the continuous mode when the cassette switched to contains paper of the same size as the paper in the cassette switched from. To de-activate the feature,

1) Press ⧆→8→⧆
2) Enter '0' using the input keypad.
3) Press the ⧆ key.

9. Setting the Copy Mode Memory

As many as four copy modes may be selected and stored.

1) Press the desired copy mode keys on the control panel.
2) Press the COPY MODE MEMORY key (M1, M2, M3, or M4).

3) Press ⊠ to store the copy mode.

① Later, a press on the COPY MODE MEMORY key will recall the stored mode.

② The memory will remain even after the RESET key is pressed or the power is switched OFF.

V. WARNINGS AND REMEDIES

A. JAM INDICATOR

If a jam occurs in the copier, be sure to check the pick-up, separation/feeder, fixing, and delivery assemblies and the cleaning unit and two-sided copy feeder assembly to remove the jam. When the front doors are opened, the jam indicator shown in Figure 1-10 will come into view to show the location of the jam.

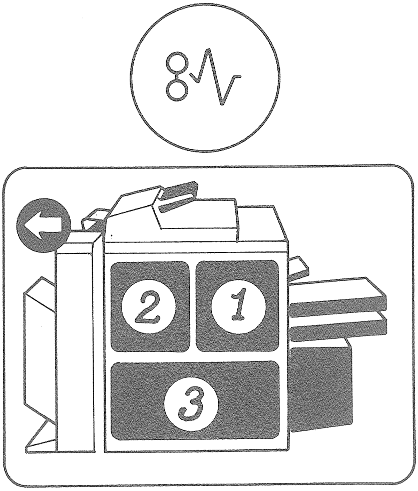


Figure 1-10

For jams that occur in the sorter or RDF, refer to the respective SERVICE MANUAL.

1. If ① or ⇨ is lit,

1) Push the green knob on the registration roller, and turn it counterclockwise to feed the jam forward.

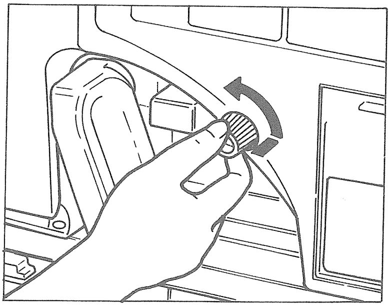


Figure 1-11

2) Shift the green lever of the feeder assembly to the right, and remove the jam.

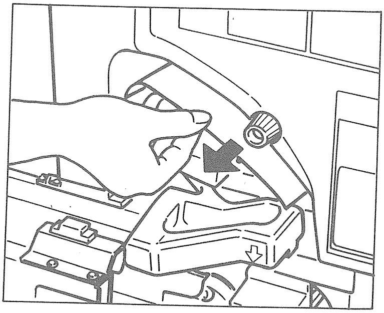


Figure 1-12

3) Open the paper deck door if the paper has been picked up from the paper deck; then, remove the paper, and close the paper deck door.

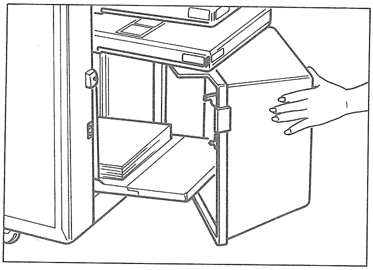


Figure 1-13

4) Slide out the cassette if the paper has been picked up from the cassette; then, remove the paper.

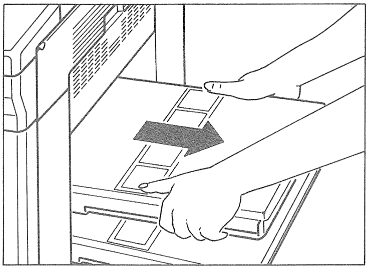


Figure 1-14

2. If ② or ⇦ is lit,

1) Open the delivery assembly.

- If the jam is under the fixing roller,

2) Turn the green knob counterclockwise, and remove the jam.

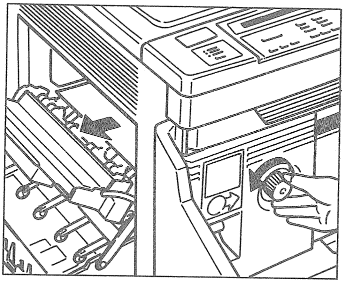


Figure 1-15

- If the two-sided/overlay mode was used,

3) Lift the cover inside the delivery assembly, and remove the jam.

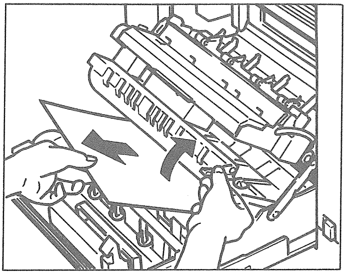


Figure 1-16

3. If ③ is lit,

1) Open the waste toner box.
2) Shift the vertical feeder assembly down, and remove the jam.

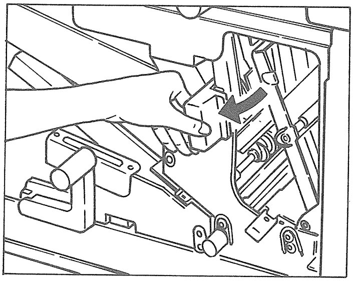


Figure 1-17

3) Turn the green knob on the two-sided copy belt clockwise to forward the jam between rollers or along the guide to the holding tray.

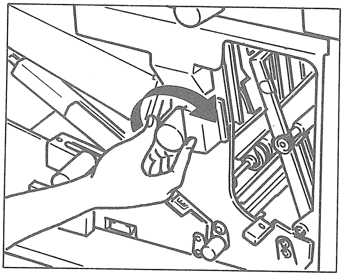


Figure 1-18

4) Lift the lever shown in Figure 1-19, and turn the knob.

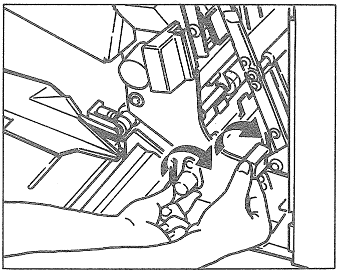


Figure 1-19

5) Hold the lever up, and remove the jam.

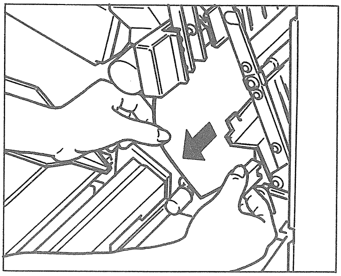


Figure 1-20

6) Shift the holding tray release lever to the left.

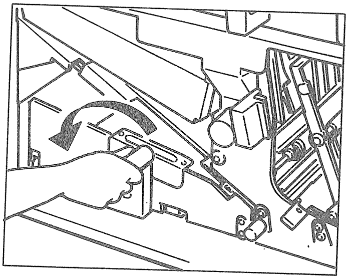


Figure 1-21

7) Slide out the holding tray, and remove all paper from the tray.

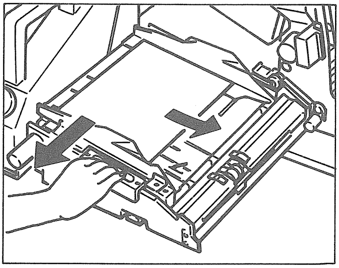


Figure 1-22

4. After Removing Jams

1) Shift all levers to their original positions.
2) Close all covers, waste toner box, and delivery assembly.

B. ADD PAPER INDICATOR

The ADD PAPER message will be indicated on the message display if no cassette is set in the selected cassette holder or no paper is set in the cassette or paper deck.

1) Slide out the cassette from the selected cassette holder.
2) Put paper in the cassette.

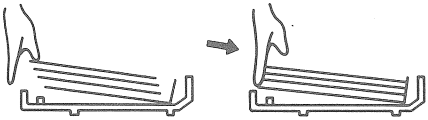
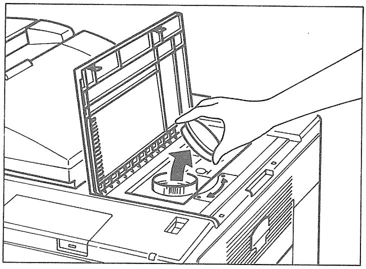


Figure 1-23

3) Push down on the leading edge of the copy paper so that it is below the claw.
4) Set the cassette in the cassette holder.

C. ADD TONER

1) Open the toner supply cover, and detach the lid from the toner supply mouth.



① Lid

Figure 1-24

2) Shake the toner bottle up and down several times.

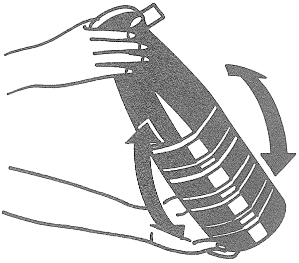
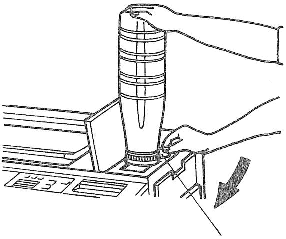


Figure 1-25

3) Detach the seal from the supply mouth of the toner bottle.
4) Fit the toner bottle into the supply mouth of the hopper.
5) Hold the toner bottle by hand, and turn the grip on the toner bottle clockwise about 90 degrees.



Handle

Figure 1-26

6) Tap the bottom and side of the toner bottle several times until all toner is inside the hopper.
7) Turn the grip on the toner bottle counterclockwise 90 degrees, and detach the toner bottle.
8) Close the toner supply cover.

VI. ROUTINE WORK BY THE USER

Advise the user to clean the following at least once a week.

1. Copyboard Glass

Wipe it using a moist cloth; then, dry wipe it.

2. RDF Feed Belt

Wipe it using a solution of mild detergent; then, dry wipe it.

CHAPTER 2

COPYING PROCESS

I. IMAGE FORMATION PROCESS..........2-1
IV. AUXILIARY PROCESSES 2-7

I. IMAGE FORMATION PROCESS

A. OUTLINE

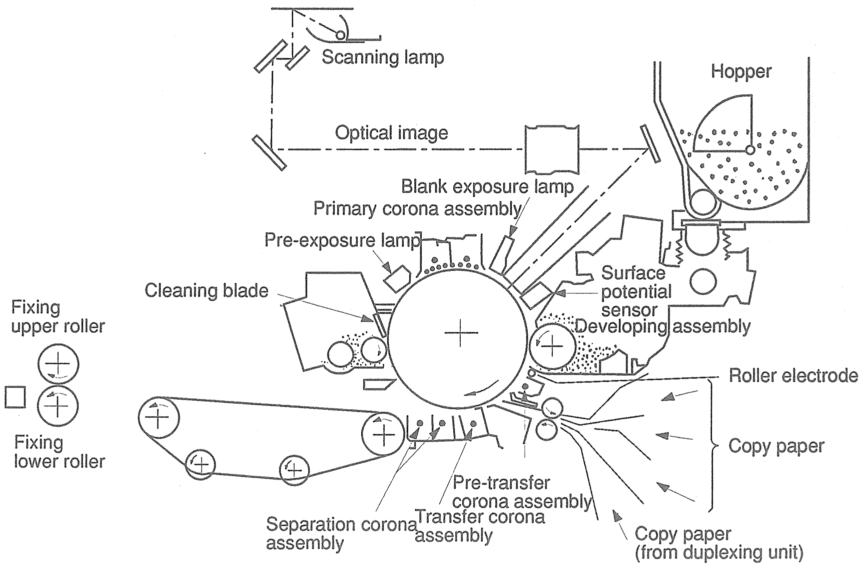

Scanning lamp
Hopper
Optical image
Blank exposure lamp
Primary corona assembly
Pre-exposure lamp
Cleaning blade
Fixing upper roller
Surface potential sensor
Developing assembly
Roller electrode
Copy paper
Fixing lower roller
Pre-transfer corona assembly
Transfer corona assembly
Separation corona assembly
Copy paper (from duplexing unit)

Figure 2-1

The copier is an electrophotographic copier equipped with a mechanism to control the surface potential of its photosensitive drum for stable reproduction of images. See Figure 2-1 for its construction; the surface potential control mechanism will be discussed later.

Figure 2-2 is a sequential diagram showing how the steps involved in the formation of images are related to each other.

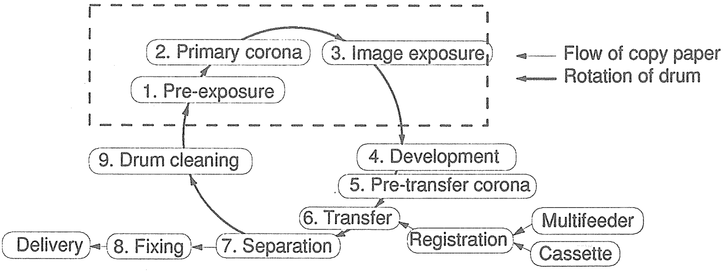

2. Primary corona
3. Image exposure
Flow of copy paper
Rotation of drum
1. Pre-exposure
9. Drum cleaning
4. Development
5. Pre-transfer corona
6. Transfer
Multifeeder
Registration
Cassette
Delivery
8. Fixing
7. Separation

Figure 2-2

The copier produces copies in the following nine steps:

Step 1 Pre-exposure
Step 2 Primary corona (positive DC)
Step 3 Image exposure
Step 4 Development (AC + positive DC)
Step 5 Pre-transfer corona (AC + negative DC)
Step 6 Transfer (positive DC)
Step 7 Separation (AC + positive DC)
Step 8 Fixing
Step 9 Drum cleaning

The photosensitive drum is of a two-layer construction; its outer layer is made of amorphous silicon, and the inner layer is an aluminum base made of conducting material.

In general, the use of amorphous silicon as a photosensitive medium ensures high durability, sensitivity, and resolution.

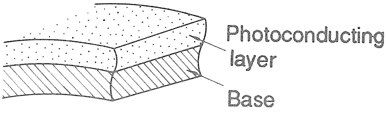


Figure 2-3

B. FORMATION OF ELECTROSTATIC LATENT IMAGES

This block consists of the first three steps of the image formation process; at its end, the areas of the drum corresponding to dark areas of the original are left with positive charges, and those representing light areas are rid of positive charges.

The copier is equipped with a mechanism to control the surface potential of the drum, thereby maintaining stable potential over the images representing both dark and light areas.

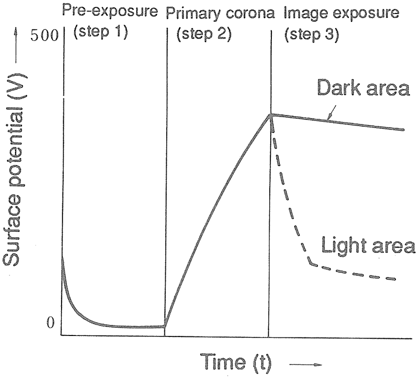


Figure 2-4

C. STEP 1 PRE-CONDITIONING EXPOSURE

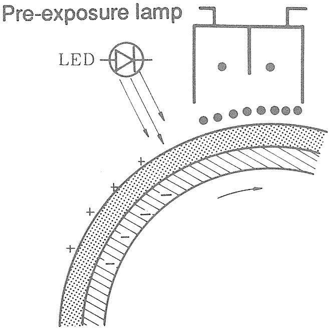


Figure 2-5

In this step, or pre-conditioning exposure, the surface of the drum is exposed to light from the pre-exposure lamp. All charges remaining on the surface of the drum from the preceding copy cycle are eliminated in preparation for exposure by the primary corona. Such charges, if left as they are, could result in copies with uneven density.

The lamp is kept at a high intensity when the drum rotates at a high speed and at a low intensity when the drum rotates at a medium to low speed.

D. STEP 2 PRIMARY CORONA EXPOSURE

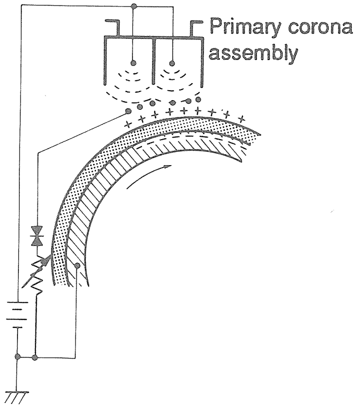

Primary corona assembly

Figure 2-6

In this step, the drum is exposed by the primary corona. As a result, its surface will come to have a uniform layer of positive charges and maintain primary potential.

The surface potential of the drum is determined by the potential of the grid bias; for this reason, the grid is grounded by way of a varistor to ensure stable surface potential of the drum.

E. STEP 3 IMAGE EXPOSURE

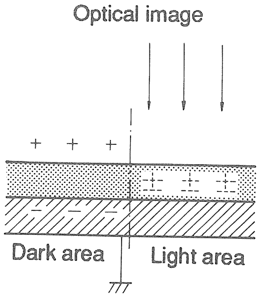

Optical image
Dark area
Light area

Figure 2-7

In this step, the optical image of the original is projected on the surface of the drum to neutralize the charges in light areas.

F. STEP 4 DEVELOPMENT

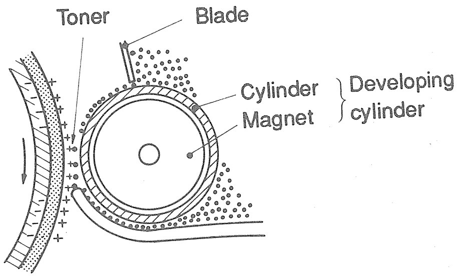

Toner
Blade
Cylinder
Magnet
Developing cylinder

Figure 2-8

As shown in Figure 2-8, the developing assembly consists of a developing cylinder and a magnetic blade; the developing cylinder itself is made up of a magnet fixed in position and a cylinder which rotates around the magnet.

The developer is a single-component developer of magnetite and resin. The developer has insulating properties and is charged to a negative potential by friction with the rotating cylinder.

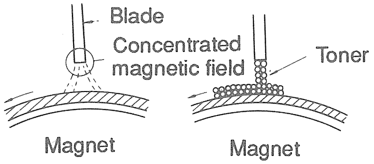

Blade
Concentrated magnetic field
Toner
Magnet
Magnet

Figure 2-9

A concentrated magnetic field develops between the magnet and the tip of the blade, and the developer is attracted to the magnetic field.

The magnetic field holds the developer it has attracted virtually immobile and creates a collection of developer particles hanging from the tip of the blade. As the cylinder rotates, the developer particles leave the magnetic field to deposit themselves on the cylinder in a thin, uniform layer.

Since both the developing cylinder and blade are given AC bias and DC bias at the same time (development bias), the resulting waveform of the developing bias has a larger positive component than negative.

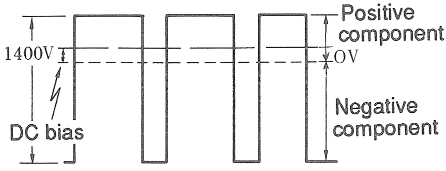


Figure 2-10

During copying operation, the toner is attracted to and repelled by the drum because of the force of the magnetism occurring between the toner and magnet and the surface potential of the drum, turning the electrostatic latent image to a visible image.

G. STEP 5 PRE-TRANSFER CORONA EXPOSURE

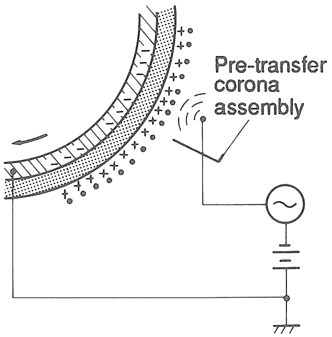


Figure 2-11

In this step, an AC corona discharge in combination with a DC bias is applied to optimize the potential of the toner on the drum surface.

This serves to improve transfer efficiency, thereby facilitating separation of the copy paper from the drum.

H. STEP 6 TRANSFER

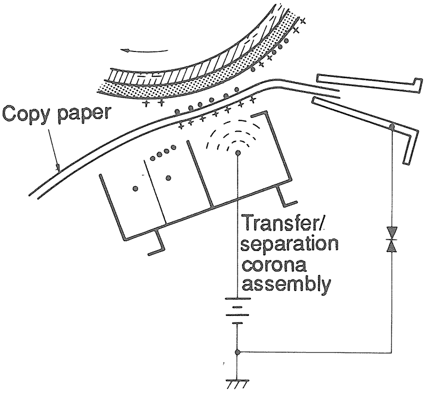


Figure 2-12

In this step, a positive corona is applied to the back of the copy paper so as to attract the negatively charged toner to the paper.

To prevent poor transfer or soiling of the back of the paper, the transfer guides are grounded through a varistor.

Note:

If grounded directly, the transfer guides will allow the charge needed on the back of the copy paper to escape; if not grounded, on the other hand, transfer guides will be charged, coated with toner, and become soiled.

I. STEP 7 SEPARATION

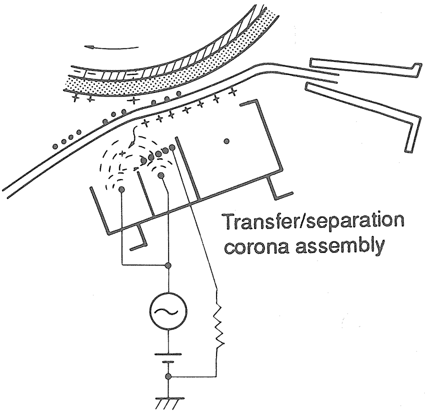


Figure 2-13

In this step, the paper is separated from the drum. The paper has been given a positive potential by the transfer corona and attracted to the surface of the drum by the work of electrostatic force. To separate the paper from the drum, an AC corona with a DC bias is applied, thereby breaking the electrostatic force between the drum and the paper.

J. STEP 8 FIXING

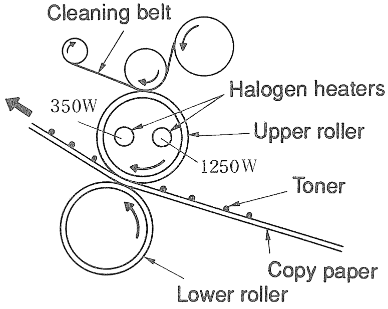

Cleaning belt
Halogen heaters
350W
Upper roller
1250W
Toner
Copy paper
Lower roller

Figure 2-14

In this step, the paper carrying a transfer image moves between two heated rollers, and the transfer image is fixed to the paper.

To prevent jams and toner offset, the upper roller remains in contact with the cleaning belt impregnated with silicone oil; the take-up mechanism advances the point of contact on the cleaning belt, thereby cleaning the upper roller and, at the same time, applying the silicone oil.

K. STEP 9 DRUM CLEANING

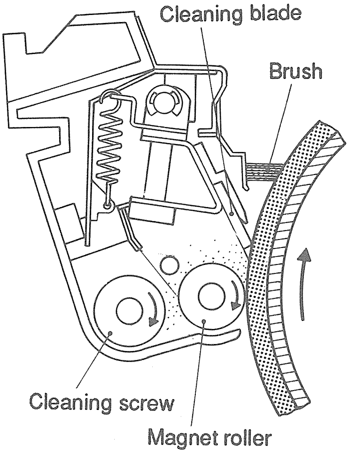

Cleaning blade
Brush
Cleaning screw
Magnet roller

Figure 2-15

In this step, the toner remaining on the drum surface is scraped off by the cleaning blade and collected by the magnet roller in preparation for the next copy cycle.

The toner so collected is forwarded by the cleaning screw for collection in the waste toner receptacle.

The friction by the magnet roller serves to create a thin, uniform layer of toner, thereby stabilizing the contact between the drum and cleaning blade and preventing cleaning failure.

II. AUXILIARY PROCESSES

A. ROLLER ELECTRODE

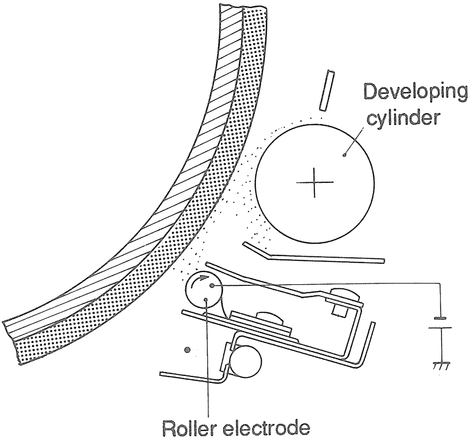


Figure 2-16

The roller electrode serves to limit the dirt collecting in the pre-transfer assembly and transfer assembly; a DC bias (negative component) is applied to the electrode, thereby attracting toner that has failed to settle on the drum.

B. SEPARATION CLAW

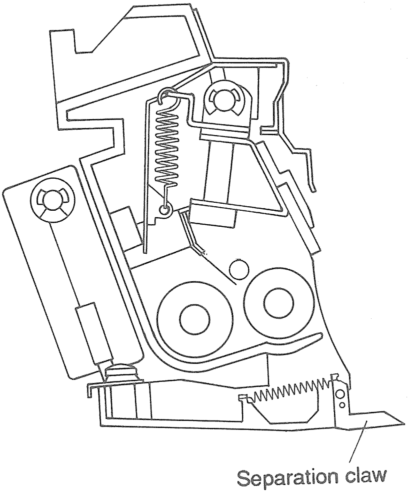


Figure 2-17

The paper would advance into the cleaning unit if not separated properly from the drum, i.e., because of faulty pre-transfer or poor separation corona operation or owing to faulty paper feed.

The separation claw is located at the bottom of the cleaning unit and serves to hook off the copy paper, preventing its advance into the cleaning unit.

C. BLANK EXPOSURE LAMP

The blank exposure lamp serves to eliminate the surface potential in the non-image areas of the photosensitive drum, thereby preventing adhesion of unwanted toner.

With the copier, any reproduction ratio may be specified; the blank exposure lamp, therefore, consists of an array of LEDs to accommodate varying non-image areas.

D. OZONE FILTER

The cooling and feed fan units are equipped with ozone filters, which break down the ozone generated by the coronas into oxygen by catalytic action.

E. STATIC CHARGE ELIMINATOR

Prior to delivery, copy paper has residual charge it has picked up during transfer. A line of metal strings is provided at the exit of the delivery assembly to serve as a static charge eliminator.

CHAPTER 3

OPERATIONS AND TIMING

In outline diagrams, ▮▮▮ represents mechanical drive paths, and → indicates electrical signal paths.

Signals in digital circuits are identified as '1' for High and '0' for Low. The voltage of signals, however depends on the circuit.

Nearly all operations of the machine are controlled by microprocessors; the internal workings of these processors are not relevant to the service technician's work and, therefore, left out of the discussions. By the same token, no repairs are prescribed for the PCBs at the user's premises; for this reason, PCBs are discussed by means of block diagrams rather than circuit diagrams.

For the purpose of explanation, discussions are divided into the following: from sensors to DC controller PCB input ports; from DC controller output ports to loads; and minor control circuits and functions.

I. CONSTRUCTION 3- 1
II. EXPOSURE SYSTEM............................3-23
III. IMAGE FORMATION SYSTEM 3-33
IV. PICK-UP UNIT 3-59
V. FEEDER AND DUPLEXING SYSTEMS 3-67
VI. POWER SUPPLY 3- 97
VII. OPERATION TABLE............................3-100
VIII. SERVICE MODE 3-104
IX. SELF DIAGNOSIS 3-138

I. CONSTRUCTION

A. FUNCTIONAL CONSTRUCTION

The copier can be divided into four functional blocks; i.e., pick-up/feed system, exposure system, image formation system, and control system.

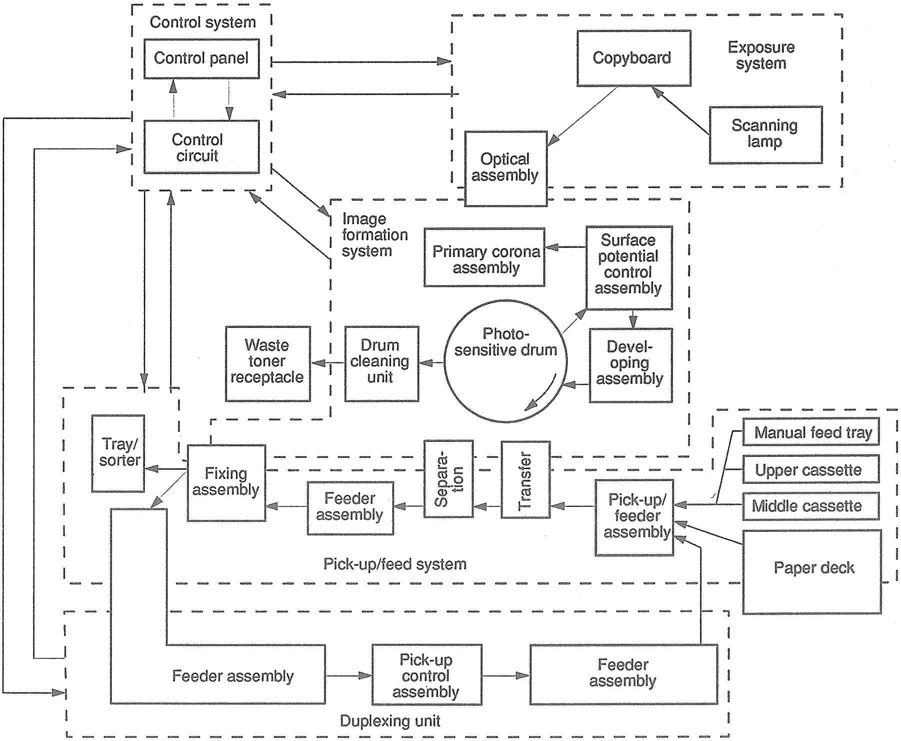

Control system
Control panel
Control circuit
Exposure system
Copyboard
Scanning lamp
Optical assembly
Image formation system
Primary corona assembly
Surface potential control assembly
Photo-sensitive drum
Devel-oping assembly
Drum cleaning unit
Waste toner receptacle
Tray/ sorter
Fixing assembly
Feeder assembly
Separa-tion
Transfer
Pick-up/ feeder assembly
Manual feed tray
Upper cassette
Middle cassette
Paper deck
Pick-up/feed system
Feeder assembly
Pick-up control assembly
Feeder assembly
Duplexing unit

Figure 3-1

B. ELECTRICAL CIRCUITRY

The copier's major electrical mechanisms are controlled by the two microprocessors on its DC controller PCB.

The functions of these microprocessors are as follows:

① Q101 (master)
- Controls the copy sequence.
- Controls the control panel.
- Controls the main motor and scanner motor.
- Controls the drum surface potential.

② Q158 (slave)
- Controls the blank exposure LED.
- Controls the scanning lamp.

The master is connected to three ROMs and two RAMs, and data flows back and forth between the master and slave as necessary.

Figure 3-2 is a block diagram that shows the relationship among the copier's major circuits.

The copier's DC controller communicates with the controller PCBs of the RDF and sorter to control the operation of the RDF and sorter.

The input assembly of each microprocessor is equipped with a buffer and the output assembly, with a driver; however, they are not shown in the block diagram.

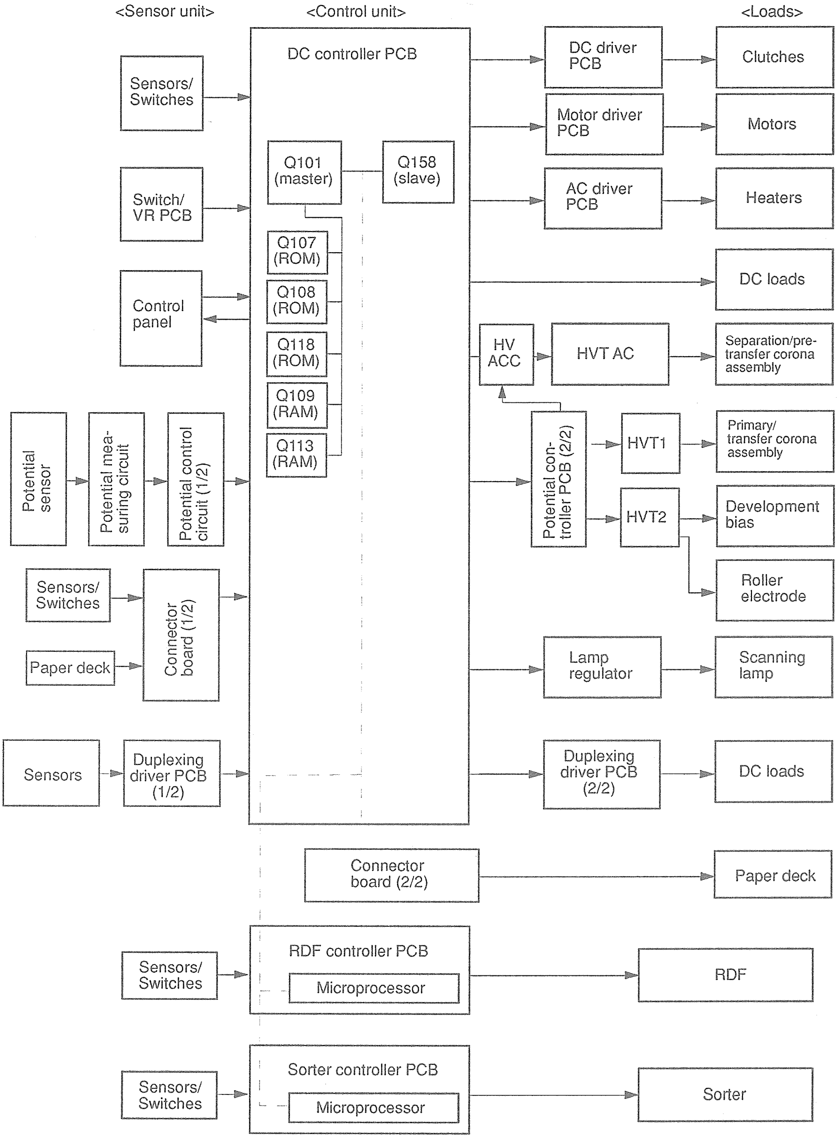

<Sensor unit>
<Control unit>
<Loads>
DC controller PCB
Sensors/ Switches
Switch/ VR PCB
Control panel
Q101 (master)
Q158 (slave)
Q107 (ROM)
Q108 (ROM)
Q118 (ROM)
Q109 (RAM)
Q113 (RAM)
DC driver PCB
Motor driver PCB
AC driver PCB
Clutches
Motors
Heaters
DC loads
HV ACC
HVT AC
Separation/pre-transfer corona assembly
Potential sensor
Potential measuring circuit
Potential control circuit (1/2)
Potential controller PCB (2/2)
HVT1
HVT2
Primary/ transfer corona assembly
Development bias
Roller electrode
Sensors/ Switches
Paper deck
Connector board (1/2)
Lamp regulator
Scanning lamp
Sensors
Duplexing driver PCB (1/2)
Duplexing driver PCB (2/2)
DC loads
Connector board (2/2)
Paper deck
Sensors/ Switches
RDF controller PCB
Microprocessor
RDF
Sensors/ Switches
Sorter controller PCB
Microprocessor
Sorter

Figure 3-2

C. INPUTS TO DC CONTROLLER

1. Inputs from Copier (1/3)

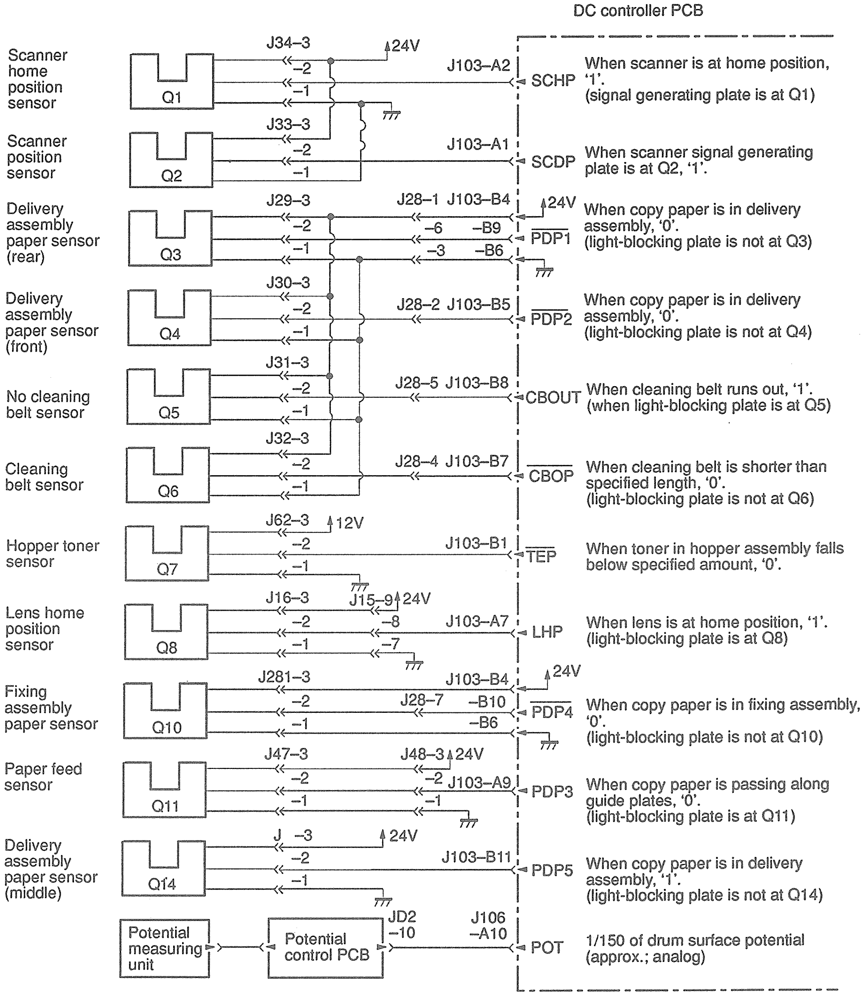

DC controller PCB
Scanner home position sensor
Q1
J34–3
–2
–1
24V
J103–A2
SCHP
When scanner is at home position, '1'.
(signal generating plate is at Q1)
Scanner position sensor
Q2
J33–3
–2
–1
J103–A1
SCDP
When scanner signal generating plate is at Q2, '1'.
Delivery assembly paper sensor (rear)
Q3
J29–3
–2
–1
J28–1 J103–B4
–6 –B9
–3 –B6
24V
PDP1
When copy paper is in delivery assembly, '0'.
(light-blocking plate is not at Q3)
Delivery assembly paper sensor (front)
Q4
J30–3
–2
–1
J28–2 J103–B5
PDP2
When copy paper is in delivery assembly, '0'.
(light-blocking plate is not at Q4)
No cleaning belt sensor
Q5
J31–3
–2
–1
J28–5 J103–B8
CBOUT
When cleaning belt runs out, '1'.
(when light-blocking plate is at Q5)
Cleaning belt sensor
Q6
J32–3
–2
–1
J28–4 J103–B7
CBOP
When cleaning belt is shorter than specified length, '0'.
(light-blocking plate is not at Q6)
Hopper toner sensor
Q7
J62–3
–2
–1
12V
J103–B1
TEP
When toner in hopper assembly falls below specified amount, '0'.
Lens home position sensor
Q8
J16–3
–2
–1
J15–9
–8
–7
24V
J103–A7
LHP
When lens is at home position, '1'.
(light-blocking plate is at Q8)
Fixing assembly paper sensor
Q10
J281–3
–2
–1
J103–B4
J28–7 –B10
–B6
24V
PDP4
When copy paper is in fixing assembly, '0'.
(light-blocking plate is not at Q10)
Paper feed sensor
Q11
J47–3
–2
–1
J48–3
–2
–1
24V
J103–A9
PDP3
When copy paper is passing along guide plates, '0'.
(light-blocking plate is at Q11)
Delivery assembly paper sensor (middle)
Q14
J –3
–2
–1
24V
J103–B11
PDP5
When copy paper is in delivery assembly, '1'.
(light-blocking plate is not at Q14)
Potential measuring unit
Potential control PCB
JD2
–10
J106
–A10
POT
1/150 of drum surface potential (approx.; analog)

Figure 3-3

2. Inputs from Copier (2/3)

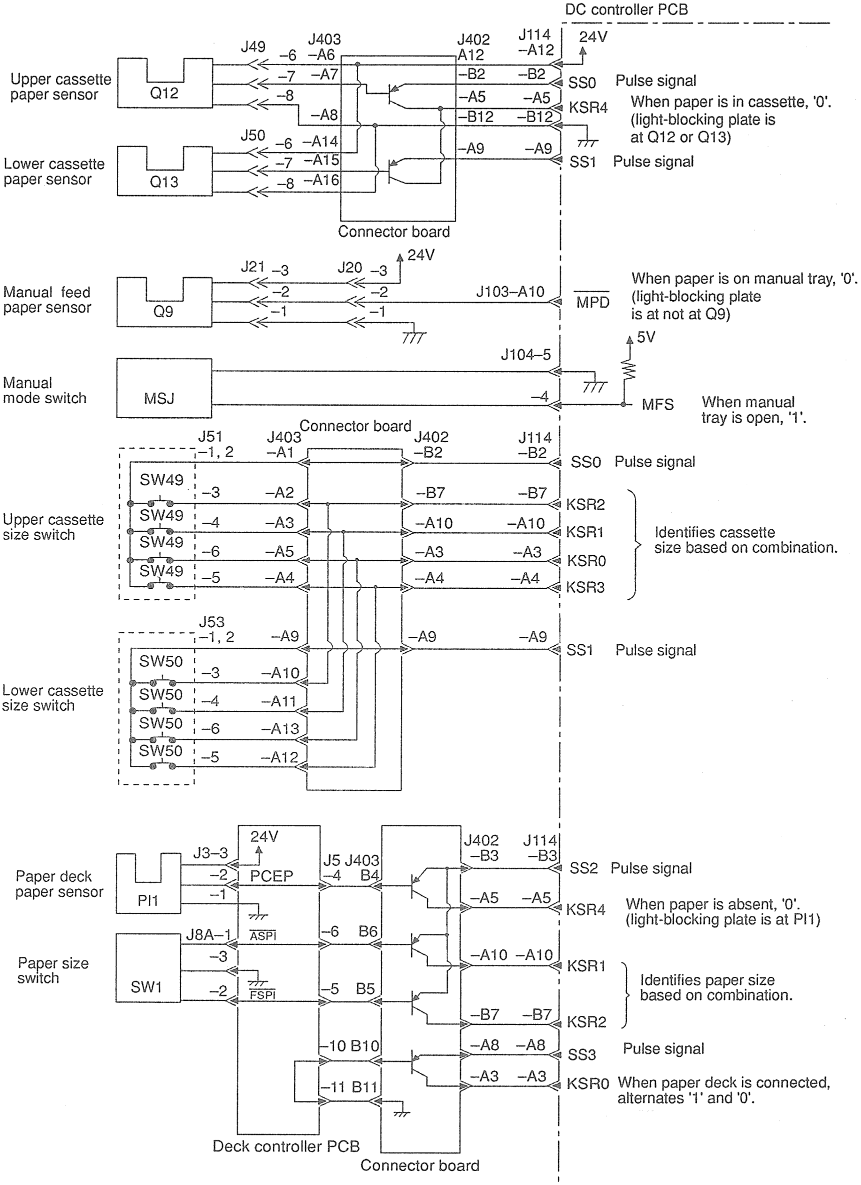

DC controller PCB
J49
J403
J402
J114
24V
-6 -A6
A12
-A12
Upper cassette paper sensor
Q12
-7 -A7
-B2 -B2
SS0 Pulse signal
-8
-A5 -A5
KSR4
When paper is in cassette, '0'. (light-blocking plate is at Q12 or Q13)
-A8
-B12 -B12
J50
-6 -A14
Lower cassette paper sensor
Q13
-7 -A15
-A9 -A9
SS1 Pulse signal
-8 -A16
Connector board
J21 -3
J20 -3
24V
Manual feed paper sensor
Q9
-2 -2
J103-A10
MPD
When paper is on manual tray, '0'. (light-blocking plate is at not at Q9)
-1 -1
5V
J104-5
Manual mode switch
MSJ
-4
MFS
When manual tray is open, '1'.
Connector board
J51
J403
J402
J114
-1, 2 -A1 -B2 -B2
SS0 Pulse signal
Upper cassette size switch
SW49
-3 -A2 -B7 -B7
KSR2
-4 -A3 -A10 -A10
KSR1
Identifies cassette size based on combination.
-6 -A5 -A3 -A3
KSR0
-5 -A4 -A4 -A4
KSR3
J53
-1, 2 -A9 -A9 -A9
SS1 Pulse signal
Lower cassette size switch
SW50
-3 -A10
-4 -A11
-6 -A13
-5 -A12
Paper deck paper sensor
PI1
J3-3
-2
-1
24V
PCEP
J5 J403
-4 B4
J402 J114
-B3 -B3
SS2 Pulse signal
-A5 -A5
KSR4
When paper is absent, '0'. (light-blocking plate is at PI1)
Paper size switch
SW1
J8A-1
ASPI
-6 B6
-3
-A10 -A10
KSR1
-2
FSPI
-5 B5
Identifies paper size based on combination.
-B7 -B7
KSR2
-10 B10
-A8 -A8
SS3 Pulse signal
-11 B11
-A3 -A3
KSR0 When paper deck is connected, alternates '1' and '0'.
Deck controller PCB
Connector board

Figure 3-4

3. Inputs from Copier (3/3)

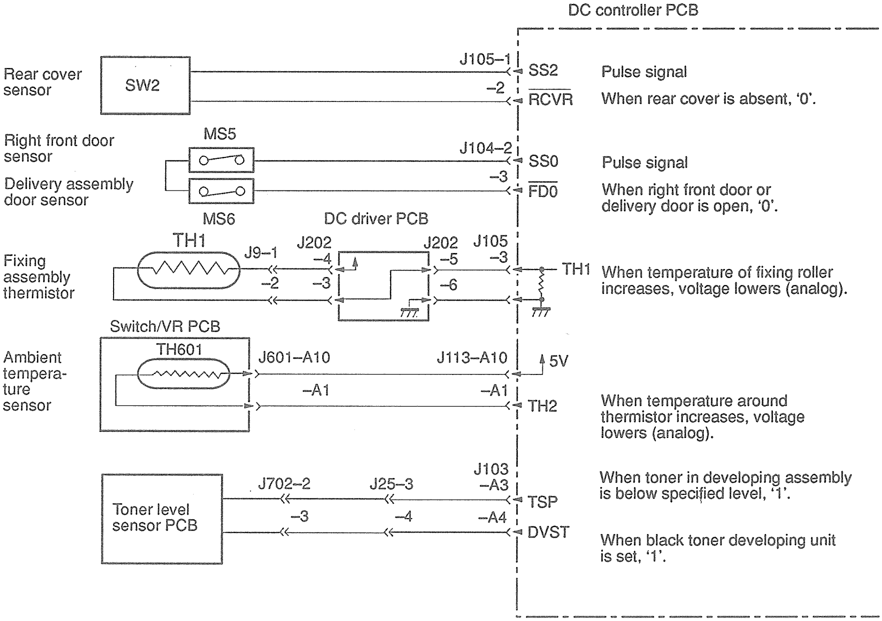
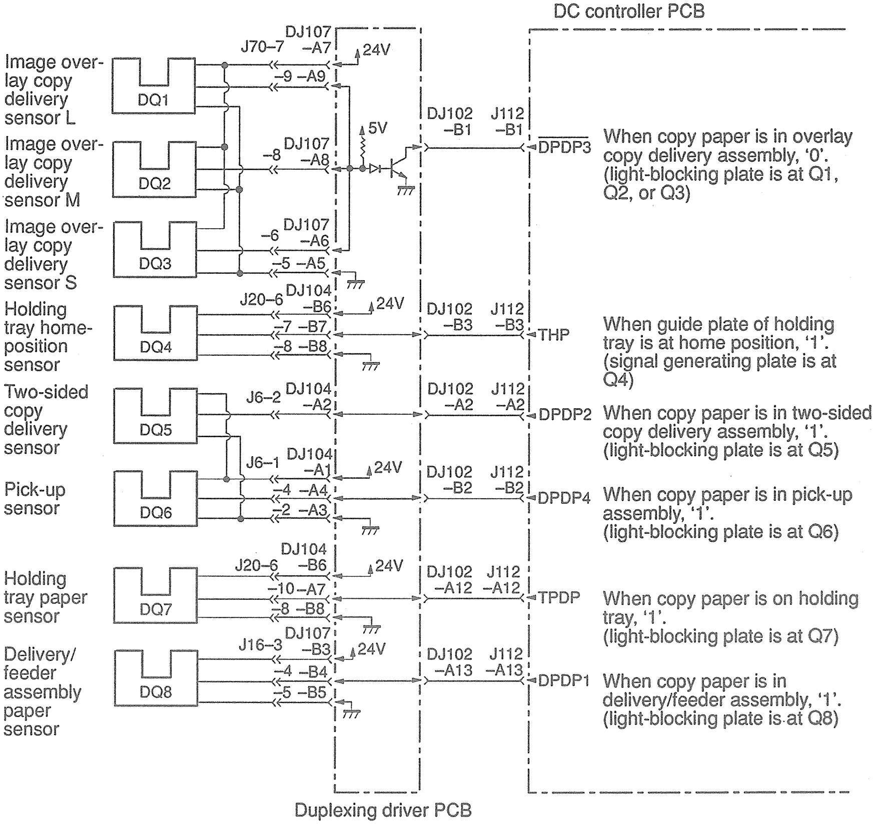

DC controller PCB
Rear cover sensor
SW2
J105–1
SS2
Pulse signal
–2
RCVR
When rear cover is absent, '0'.
Right front door sensor
MS5
J104–2
SS0
Pulse signal
Delivery assembly door sensor
–3
FDO
When right front door or delivery door is open, '0'.
MS6
DC driver PCB
TH1
J9–1
J202
–4
J202
–5
J105
–3
TH1
When temperature of fixing roller increases, voltage lowers (analog).
Fixing assembly thermistor
–2
–3
–6
Switch/VR PCB
TH601
Ambient tempera-ture sensor
J601–A10
J113–A10
5V
–A1
–A1
TH2
When temperature around thermistor increases, voltage lowers (analog).
J103
–A3
Toner level sensor PCB
J702–2
J25–3
TSP
When toner in developing assembly is below specified level, '1'.
–3
–4
–A4
DVST
When black toner developing unit is set, '1'.

Figure 3-5

4. Inputs to DC Controller from Duplexing Assembly


DC controller PCB
Image over-lay copy delivery sensor L
DQ1
Image over-lay copy delivery sensor M
DQ2
Image over-lay copy delivery sensor S
DQ3
Holding tray home-position sensor
DQ4
Two-sided copy delivery sensor
DQ5
Pick-up sensor
DQ6
Holding tray paper sensor
DQ7
Delivery/feeder assembly paper sensor
DQ8
DJ107
J70–7 –A7
24V
–9 –A9
–8 DJ107 –A8
5V
–6 DJ107 –A6
–5 –A5
J20–6 DJ104 –B6
24V
–7 –B7
–8 –B8
J6–2 DJ104 –A2
J6–1 DJ104 –A1
24V
–4 –A4
–2 –A3
DJ104
J20–6 –B6
24V
–10 –A7
–8 –B8
DJ107
J16–3 –B3
24V
–4 –B4
–5 –B5
DJ102 J112
–B1 –B1
$\overline{\text{DPDP3}}$
DJ102 J112
–B3 –B3
THP
DJ102 J112
–A2 –A2
DPDP2
DJ102 J112
–B2 –B2
DPDP4
DJ102 J112
–A12 –A12
TPDP
DJ102 J112
–A13 –A13
DPDP1
Duplexing driver PCB

When copy paper is in overlay copy delivery assembly, '0'. (light-blocking plate is at Q1, Q2, or Q3)

When guide plate of holding tray is at home position, '1'. (signal generating plate is at Q4)

When copy paper is in two-sided copy delivery assembly, '1'. (light-blocking plate is at Q5)

When copy paper is in pick-up assembly, '1'. (light-blocking plate is at Q6)

When copy paper is on holding tray, '1'. (light-blocking plate is at Q7)

When copy paper is in delivery/feeder assembly, '1'. (light-blocking plate is at Q8)

Figure 3-6

D. OUTPUTS FROM DC CONTROLLER

1. Outputs from DC Controller PCB (1/5)

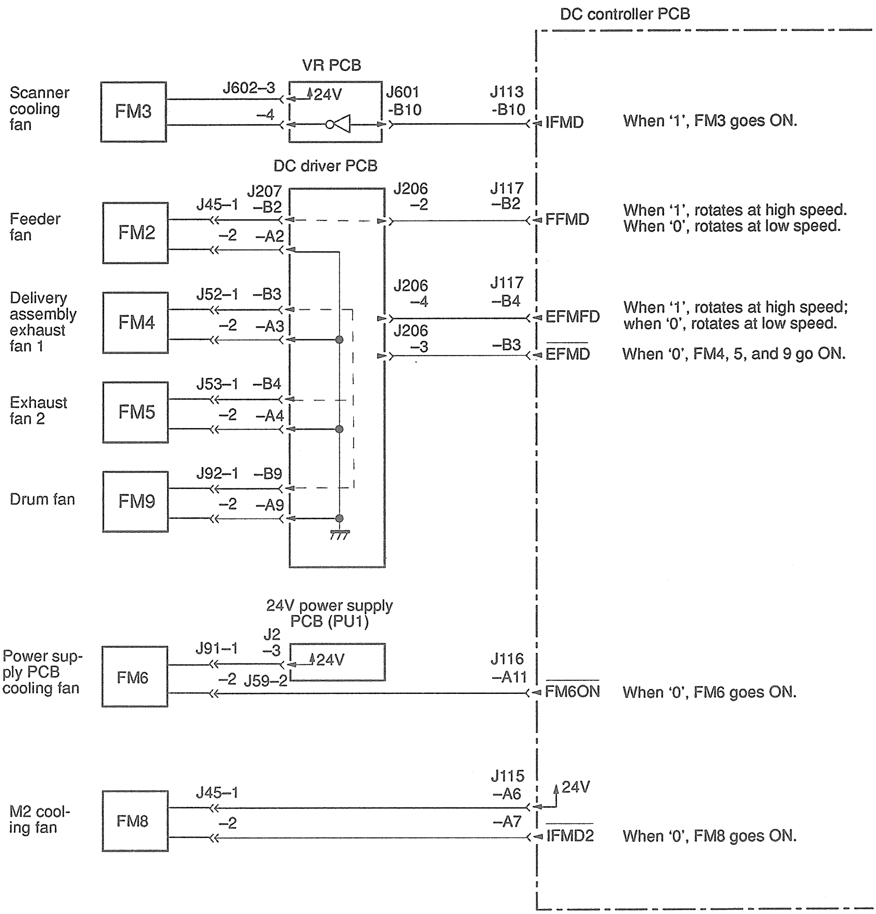
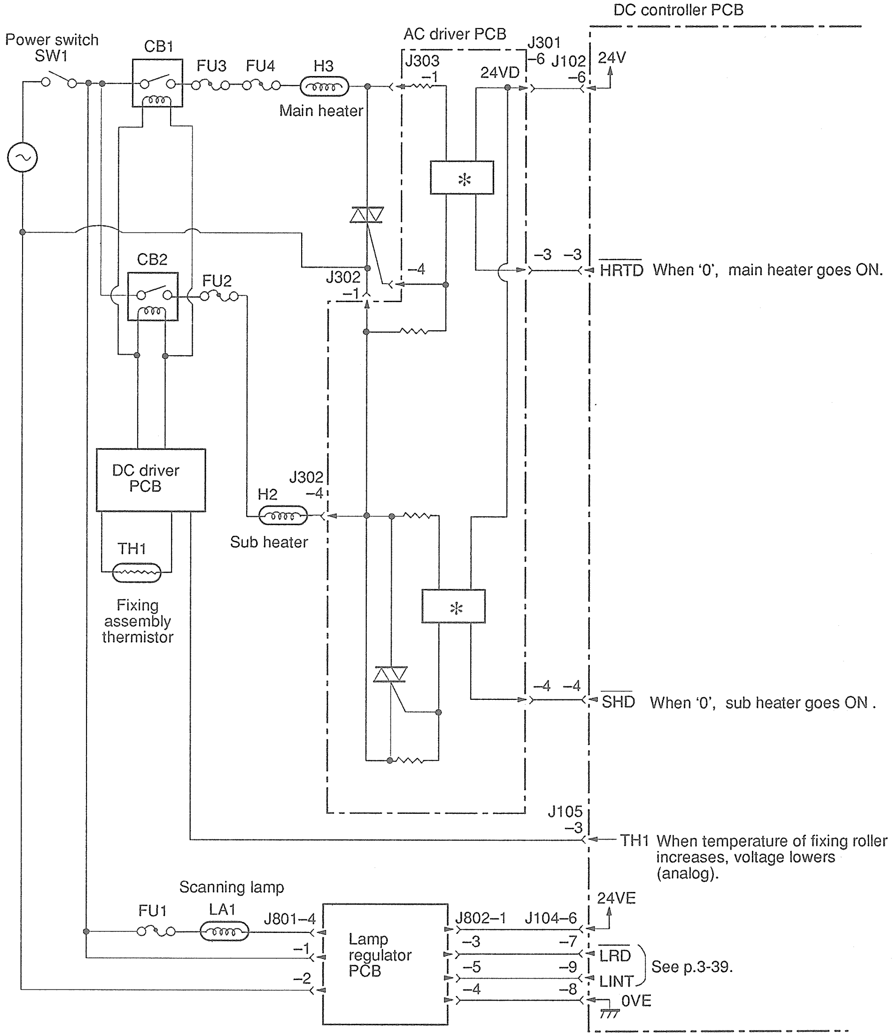

DC controller PCB
VR PCB
Scanner cooling fan
FM3
J602–3
–4
24V
J601 -B10
J113 -B10
IFMD
When '1', FM3 goes ON.
DC driver PCB
Feeder fan
FM2
J45–1
–2
J207 –B2
–A2
J206 –2
J117 –B2
FFMD
When '1', rotates at high speed.
When '0', rotates at low speed.
Delivery assembly exhaust fan 1
FM4
J52–1
–2
–B3
–A3
J206 –4
J117 –B4
EFMFD
When '1', rotates at high speed; when '0', rotates at low speed.
J206 –3
–B3
EFMD
When '0', FM4, 5, and 9 go ON.
Exhaust fan 2
FM5
J53–1
–2
–B4
–A4
Drum fan
FM9
J92–1
–2
–B9
–A9
24V power supply PCB (PU1)
Power supply PCB cooling fan
FM6
J91–1
–2
J2 –3
J59–2
24V
J116 –A11
FM6ON
When '0', FM6 goes ON.
M2 cooling fan
FM8
J45–1
–2
J115 –A6
–A7
24V
IFMD2
When '0', FM8 goes ON.

Figure 3-7

2. Outputs from DC Controller PCB (2/5)


DC controller PCB
Power switch SW1
CB1
FU3
FU4
H3
Main heater
AC driver PCB
J303 -1
J301 -6
J102 -6
24VD
24V
CB2
FU2
J302 -1
-4
-3 -3
HRTD When '0', main heater goes ON.
DC driver PCB
H2
J302 -4
Sub heater
TH1
Fixing assembly thermistor
-4 -4
SHD When '0', sub heater goes ON .
J105 -3
TH1 When temperature of fixing roller increases, voltage lowers (analog).
24VE
Scanning lamp
FU1
LA1
J801-4
-1
-2
Lamp regulator PCB
J802-1
-3
-5
-4
J104-6
-7
-9
-8
LRD
LINT
See p.3-39.
0VE

* Photocoupler.

Figure 3-8

3. Outputs from DC Controller PCB (3/5)

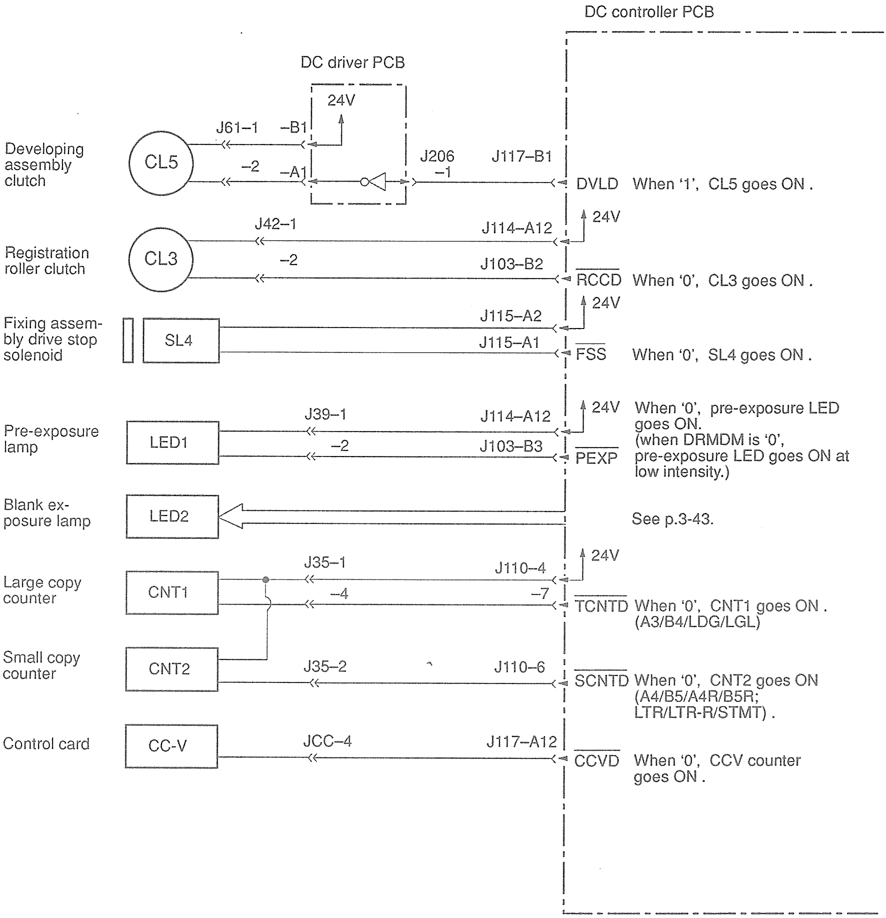

DC controller PCB
DC driver PCB
24V
Developing assembly clutch
CL5
J61–1
–B1
–2
–A1
J206
–1
J117–B1
DVLD
When '1', CL5 goes ON .
Registration roller clutch
CL3
J42–1
–2
J114–A12
J103–B2
24V
RCCD
When '0', CL3 goes ON .
Fixing assembly drive stop solenoid
SL4
J115–A2
J115–A1
24V
FSS
When '0', SL4 goes ON .
Pre-exposure lamp
LED1
J39–1
–2
J114–A12
J103–B3
24V
PEXP
When '0', pre-exposure LED goes ON. (when DRMDM is '0', pre-exposure LED goes ON at low intensity.)
Blank exposure lamp
LED2
See p.3-43.
Large copy counter
CNT1
J35–1
–4
J110–4
–7
24V
TCNTD
When '0', CNT1 goes ON . (A3/B4/LDG/LGL)
Small copy counter
CNT2
J35–2
J110–6
SCNTD
When '0', CNT2 goes ON (A4/B5/A4R/B5R; LTR/LTR-R/STMT) .
Control card
CC-V
JCC–4
J117–A12
CCVD
When '0', CCV counter goes ON .

Figure 3-9

4. Outputs from DC Controller PCB (4/5)

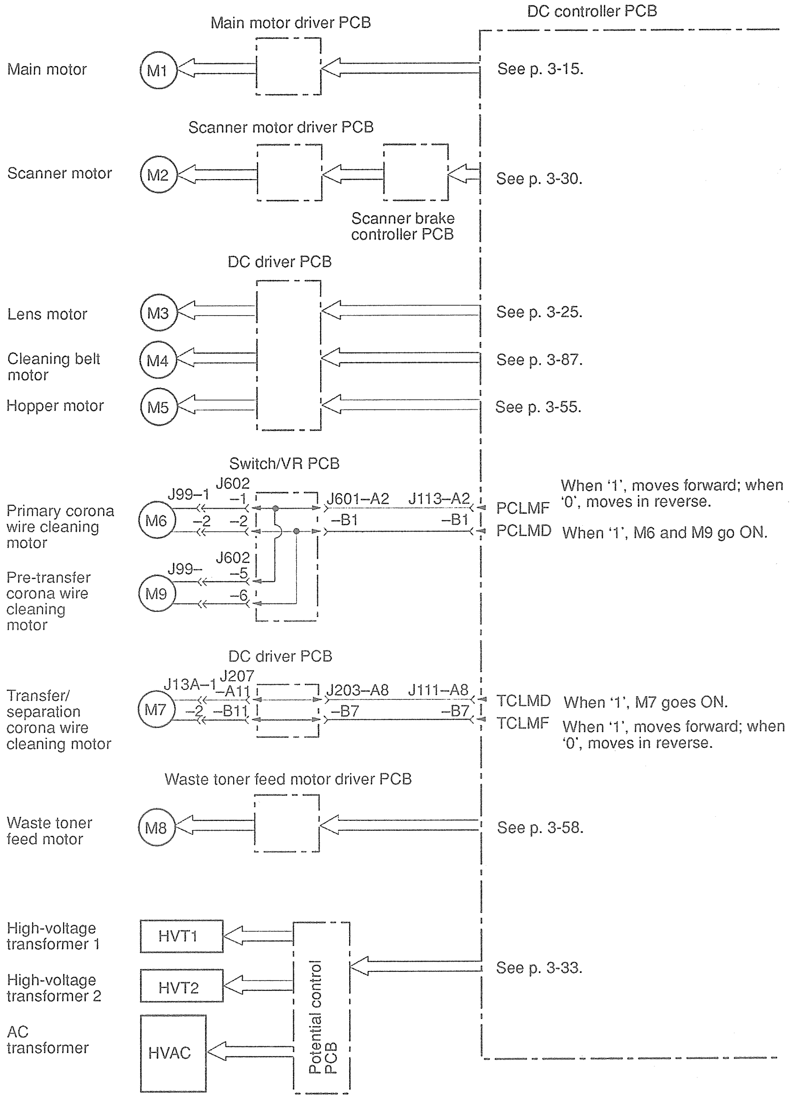

DC controller PCB
Main motor driver PCB
Main motor
M1
See p. 3-15.
Scanner motor driver PCB
Scanner motor
M2
See p. 3-30.
Scanner brake controller PCB
DC driver PCB
Lens motor
M3
See p. 3-25.
Cleaning belt motor
M4
See p. 3-87.
Hopper motor
M5
See p. 3-55.
Switch/VR PCB
J99–1
J602 –1
–2
–2
J601–A2
J113–A2
–B1
–B1
PCLMF
When '1', moves forward; when '0', moves in reverse.
PCLMD
When '1', M6 and M9 go ON.
Primary corona wire cleaning motor
M6
J602
J99–
–5
–6
Pre-transfer corona wire cleaning motor
M9
DC driver PCB
J13A–1
J207 –A11
–2
–B11
J203–A8
J111–A8
–B7
–B7
TCLMD
When '1', M7 goes ON.
TCLMF
When '1', moves forward; when '0', moves in reverse.
Transfer/ separation corona wire cleaning motor
M7
Waste toner feed motor driver PCB
Waste toner feed motor
M8
See p. 3-58.
High-voltage transformer 1
HVT1
High-voltage transformer 2
HVT2
AC transformer
HVAC
Potential control PCB
See p. 3-33.

Figure 3-10

5. Outputs from DC Controller PCB (5/5)

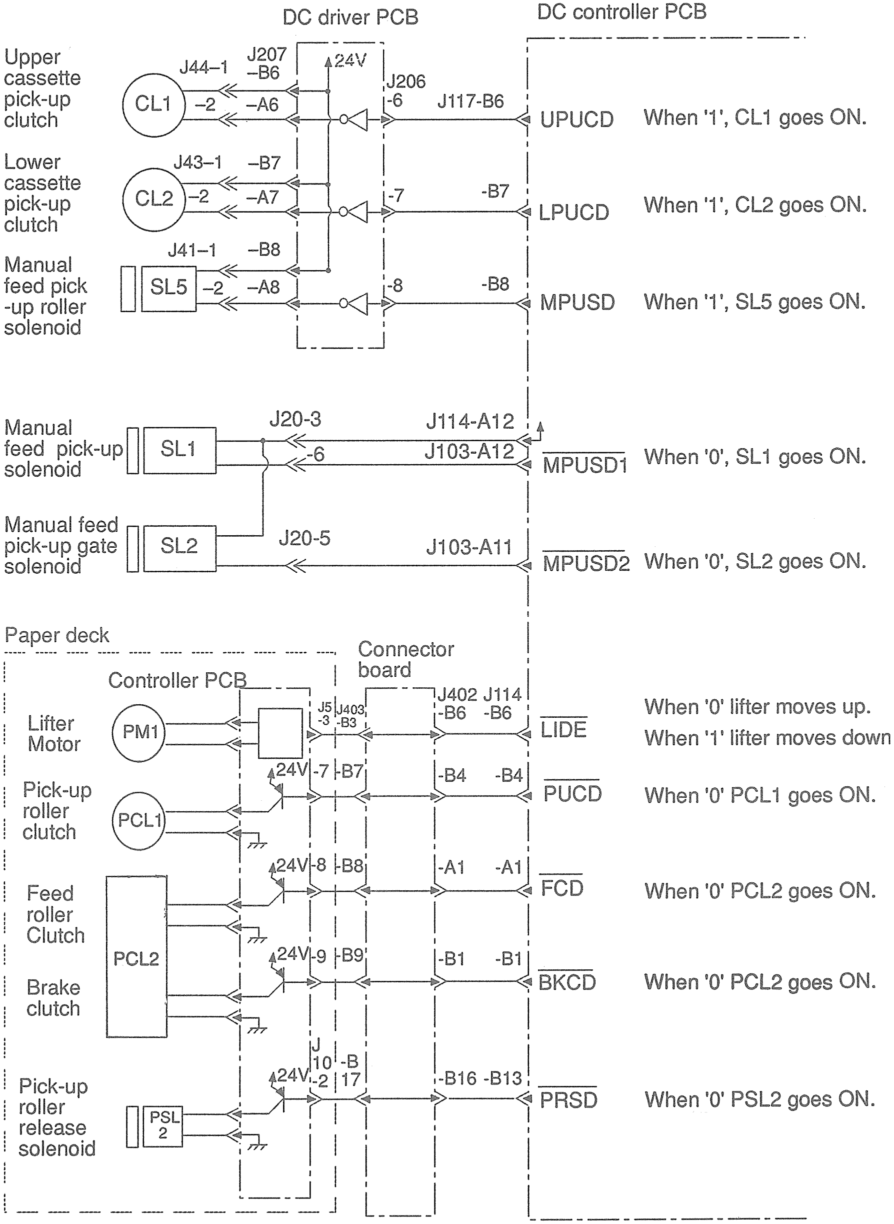

DC driver PCB
DC controller PCB
Upper cassette pick-up clutch
CL1
J44–1
–2
J207 –B6
–A6
24V
J206 -6
J117-B6
UPUCD
When '1', CL1 goes ON.
Lower cassette pick-up clutch
CL2
J43–1
–2
–B7
–A7
-7
-B7
LPUCD
When '1', CL2 goes ON.
Manual feed pick -up roller solenoid
SL5
J41–1
–2
–B8
–A8
-8
-B8
MPUSD
When '1', SL5 goes ON.
Manual feed pick-up solenoid
SL1
J20-3
-6
J114-A12
J103-A12
MPUSD1
When '0', SL1 goes ON.
Manual feed pick-up gate solenoid
SL2
J20-5
J103-A11
MPUSD2
When '0', SL2 goes ON.
Paper deck
Controller PCB
Connector board
Lifter Motor
PM1
J5 -3
J403 -B3
J402 -B6
J114 -B6
LIDE
When '0' lifter moves up.
When '1' lifter moves down
Pick-up roller clutch
PCL1
24V
-7
-B7
-B4
-B4
PUCD
When '0' PCL1 goes ON.
Feed roller Clutch
PCL2
24V
-8
-B8
-A1
-A1
FCD
When '0' PCL2 goes ON.
Brake clutch
24V
-9
-B9
-B1
-B1
BKCD
When '0' PCL2 goes ON.
Pick-up roller release solenoid
PSL 2
24V
J 10 -2
-B 17
-B16
-B13
PRSD
When '0' PSL2 goes ON.

Figure 3-11

6. Outputs from DC Controller PCB to Duplexing Unit (1/2)

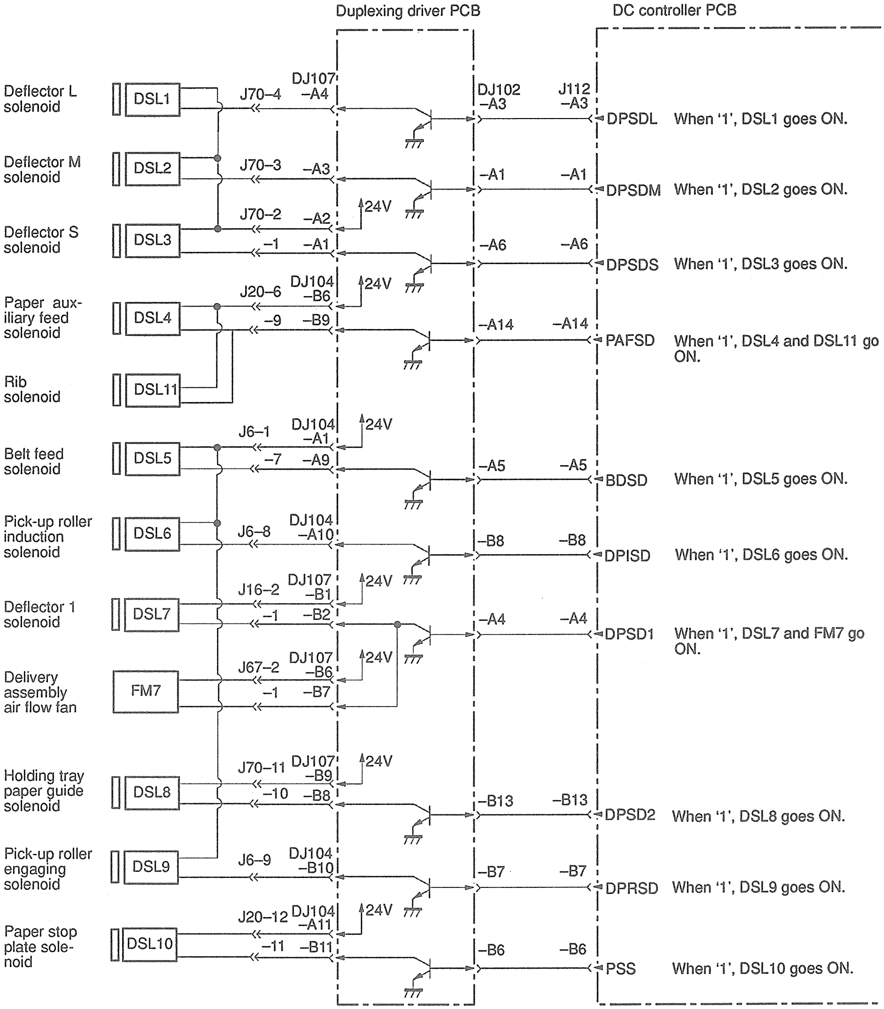

Duplexing driver PCB
DC controller PCB
Deflector L solenoid
DSL1
J70–4
DJ107
–A4
DJ102
–A3
J112
–A3
DPSDL
When '1', DSL1 goes ON.
Deflector M solenoid
DSL2
J70–3
–A3
–A1
–A1
DPSDM
When '1', DSL2 goes ON.
J70–2
–A2
24V
Deflector S solenoid
DSL3
–1
–A1
–A6
–A6
DPSDS
When '1', DSL3 goes ON.
J20–6
DJ104
–B6
24V
Paper auxiliary feed solenoid
DSL4
–9
–B9
–A14
–A14
PAFSD
When '1', DSL4 and DSL11 go ON.
Rib solenoid
DSL11
J6–1
DJ104
–A1
24V
Belt feed solenoid
DSL5
–7
–A9
–A5
–A5
BDSD
When '1', DSL5 goes ON.
Pick-up roller induction solenoid
DSL6
J6–8
DJ104
–A10
–B8
–B8
DPISD
When '1', DSL6 goes ON.
J16–2
DJ107
–B1
24V
Deflector 1 solenoid
DSL7
–1
–B2
–A4
–A4
DPSD1
When '1', DSL7 and FM7 go ON.
J67–2
DJ107
–B6
24V
Delivery assembly air flow fan
FM7
–1
–B7
J70–11
DJ107
–B9
24V
Holding tray paper guide solenoid
DSL8
–10
–B8
–B13
–B13
DPSD2
When '1', DSL8 goes ON.
Pick-up roller engaging solenoid
DSL9
J6–9
DJ104
–B10
–B7
–B7
DPRSD
When '1', DSL9 goes ON.
J20–12
DJ104
–A11
24V
Paper stop plate solenoid
DSL10
–11
–B11
–B6
–B6
PSS
When '1', DSL10 goes ON.

Figure 3-12

7. Outputs from DC Controller PCB to Duplexing Unit (2/2)

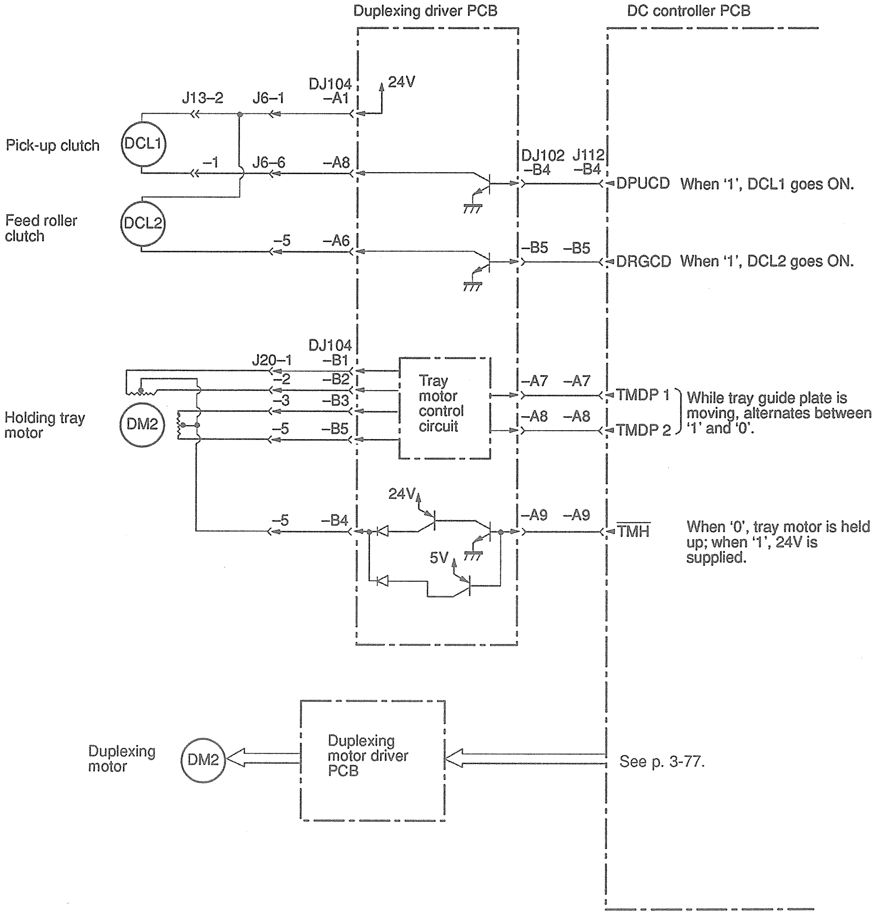

Duplexing driver PCB
DC controller PCB
DJ104 -A1
24V
J13-2
J6-1
Pick-up clutch
DCL1
-1
J6-6
-A8
DJ102 -B4
J112 -B4
DPUCD
When '1', DCL1 goes ON.
Feed roller clutch
DCL2
-5
-A6
-B5
-B5
DRGCD
When '1', DCL2 goes ON.
DJ104
J20-1
-B1
-2
-B2
-3
-B3
-5
-B5
Holding tray motor
DM2
Tray motor control circuit
-A7
-A7
TMDP 1
-A8
-A8
TMDP 2
While tray guide plate is moving, alternates between '1' and '0'.
24V
-5
-B4
-A9
-A9
TMH
5V
When '0', tray motor is held up; when '1', 24V is supplied.
Duplexing motor
DM2
Duplexing motor driver PCB
See p. 3-77.

Figure 3-13

E. MAIN MOTOR CONTROL CIRCUIT

1. Outline

Figure 3-14 shows the circuit that controls the main motor and has the following functions:

① Turns the main motor ON and OFF.
② Switches the speed of the main motor.
③ Controls the speed of the main motor.

The main motor is a DC motor equipped with a built-in clock pulse generator. When the motor rotates, clock pulses (MMCLK) in numbers corresponding to the revolution of the motor are issued. Using the clock pulses, the speed control circuit controls the speed of the motor.

The clock pulses are frequency-divided by four, the result of which is sent to the DC controller PCB as clock pulses (CLKP) for sequence control.

As described in Table 3-1, the motor rotates at three different speeds. The DC controller PCB generates the main motor speed control signals (MMSC0, MMSC1); the high-speed reference signal and medium speed reference signal are switched over by a switching circuit. The clock pulses generated by the motor are also sent to the switching circuit, which in turn sends reference signals and clock pulses to the speed control circuit; the speed of the motor is controlled using these two signals.

See Table 3-1 for the relationship between the motor speed and main motor speed control signals.

	Motor speed	MMSC0	MMSC1	Copier
1	High speed	1	1	During a copy run when a reproduction ratio of 90% or more is selected.
2	Medium speed	1	0	During a copy run when a reproduction ration of 89% or less is selected; the rotation is 70% of that at high speed.
3	Low speed	0	1	During manual paper pick-up; the rotation is 25% of that at high speed.
4	Srop	0	0	Other than 1, 2, and 3 above.

Table 3-1

2. Mechanism

a. Motor at Rest
When MMSC0 and MMSC1 are both '0', the ON/OFF switching circuit goes ON, causing the speed control circuit and drive circuit to go OFF. This condition keeps the main motor at rest.

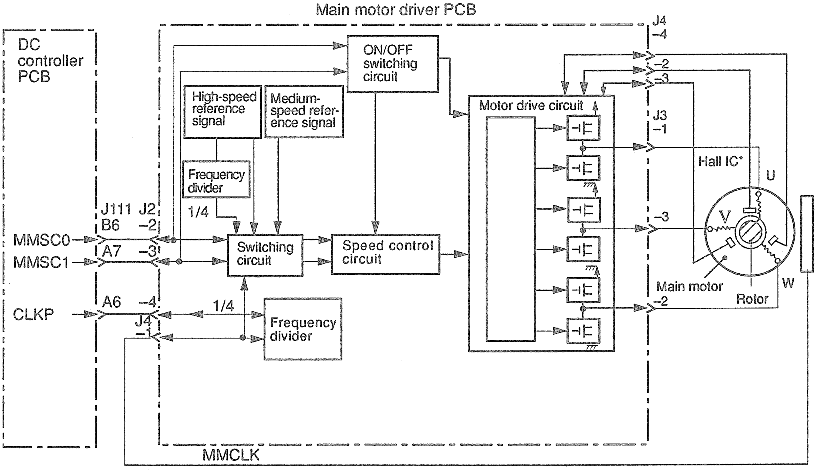
b. Motor Rotating at High Speed
When MMSC0 and MMSC1 are both '1', the high-speed reference signal from the switching circuit is sent to the speed control circuit. This condition causes the drive circuit to go ON and the main motor to rotate. When the motor has started to rotate, clock pulses (MMCLK) in numbers corresponding to the revolution of the motor are sent to the speed control circuit. In response, the speed control circuit compares the two signals it receives. It then sends the control signal to the drive circuit to keep the motor speed constant.

The drive circuit serves to keep the revolution of the motor constant by freeing it of load fluctuations, i.e., controlling the power to the motor.

c. Motor Rotating at Medium Speed
When MMSC0 is '1' and MMSC1 is '0', the medium speed reference signal is sent to the speed control circuit. The medium speed control signal represents a speed 70% of that under the high-speed reference signal; the rotation of the motor is controlled so that the clock pulses (MMCLK) it generates will be 70% of those it generates when it is rotating at high speed.

d. Motor Rotating at Low Speed
When MMSC0 is '0' and MMSC1 is '1', a signal which is the high-speed reference signal frequency-divided by four is sent to the speed control circuit; on the other hand, the clock pulses from the motor are also sent to the speed control circuit. Through these operations, the speed control circuit controls the motor to rotate at a speed one-fourth of the high-speed rotation.

e. Fault Detection
If the motor is subjected to an excessive load for some reason, the DC controller PCB checks the clock pulses from the motor for an error and, when it detects an error, indicates E010 on the display of the control panel.
The power supply line of the motor driver PCB is equipped with a fuse which, in response to an overcurrent, cuts off the power, causing the main motor to suspend rotation.


Main motor driver PCB
DC controller PCB
MMSC0
MMSC1
CLKP
J111
B6
A7
A6
J2
-2
-3
-4
J4
-1
ON/OFF switching circuit
High-speed reference signal
Medium-speed reference signal
Frequency divider
1/4
Switching circuit
Speed control circuit
1/4
Frequency divider
Motor drive circuit
J4
-4
-2
-3
J3
-1
-3
-2
Hall IC*
U
V
W
Main motor
Rotor
MMCLK

* Checks the rotor polarity.

Figure 3-14

F. BASIC SEQUENCE

1. Basic Sequence (at power-on)

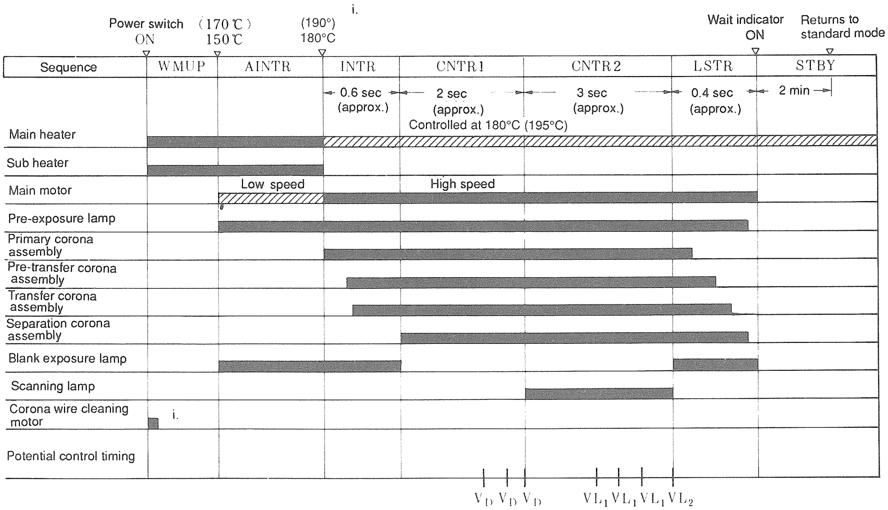

i.
Power switch ON
(170℃) 150℃
(190°) 180°C
Wait indicator ON
Returns to standard mode
Sequence
WMUP
AINTR
INTR
CNTR1
CNTR2
LSTR
STBY
0.6 sec (approx.)
2 sec (approx.)
3 sec (approx.)
0.4 sec (approx.)
2 min
Controlled at 180°C (195°C)
Main heater
Sub heater
Main motor
Low speed
High speed
Pre-exposure lamp
Primary corona assembly
Pre-transfer corona assembly
Transfer corona assembly
Separation corona assembly
Blank exposure lamp
Scanning lamp
Corona wire cleaning motor
i.
Potential control timing
V_D V_D V_D
VL_1 VL_1 VL_1 VL_2

Figure 3-15

Note:

i Values in parentheses are control temperatures when the ambient temperature (TH601) is less than 18°C.

ii. If the temperature of the fixing assembly is 150°C or less when the power is switched ON, the primary, transfer, separation, and pre-transfer corona assembly wires are cleaned; this cleaning operation is also executed every 2000 copies.

Period		Description	Remarks
WMUP (warm up)	From when the power is switched ON until the surface temperature of the fixing upper roller reaches 150°C (170°C).	• Waits until the fixing assembly warms up.	• If the fixing roller is 150°C or lower at power-on, the primary, separation, pre-transfer, and transfer corona wires are cleaned.
AINTR (additional initial rotation)	From when WMUP is completed until the surface temperature of the fixing assembly upper roller reaches 180°C (190°C).	• Evens out the surface temperature of the fixing assembly roller. • Delivers copy paper, if any.	• The drum rotates at a low speed. • The lens moves to the DIRECT position. • Even if the surface temperature of the fixing assembly upper roller is 150°C (170°C) at power-on, AINTR is executed.
INTR (initial rotation)	From when the surface temperature of the fixing assembly upper roller has reached 180°C (195°C) until the drum makes a 1/2 rotation.	• Rotates the drum at a high speed to stabilize its sensitivity in preparation for copying operation.	
CNTR1 (control rotation 1)	For about 2 sec after INTR has been completed.	Controls the surface potential (V_D) of the drum.	
CNTR2 (control rotation)	For about 3 sec after CNTR1 has been completed.	Controls the surface potential (V_L) of the drum.	The development bias (DC component) for copying operation is determined according to V_L (last measurement).
LSTR (last rotation)	About 0.4 sec after CNTR2 has been completed.	The surface of the drum is cleaned electrostatically to remove residual charge.	
STBY	From when LSTR has been completed until the COPY START key is pressed or the power is switched OFF.	• Waits for a press on the COPY START key or other operation keys.	The indications on the control panel returns to standard mode indications 2 min after LSTR is over.

Table 3-2

2. Basic Sequence (during copying operation)

Copying operation starts in response to a press on the COPY START key when all conditions are met during standby.

Conditions

a. The surface temperature of the fixing roller is of the specified value or more.
b. The toner inside the hopper is of the specified amount or more.
c. Paper is present.
e. The length of the cleaning belt is of the specified value or more.

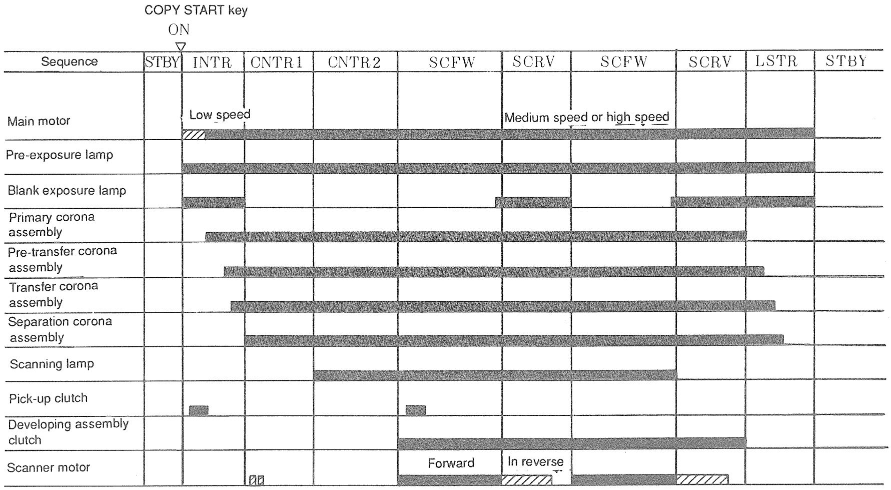

COPY START key
ON
Sequence
STBY
INTR
CNTR1
CNTR2
SCFW
SCRV
SCFW
SCRV
LSTR
STBY
Main motor
Low speed
Medium speed or high speed
Pre-exposure lamp
Blank exposure lamp
Primary corona assembly
Pre-transfer corona assembly
Transfer corona assembly
Separation corona assembly
Scanning lamp
Pick-up clutch
Developing assembly clutch
Scanner motor
Forward
In reverse

Figure 3-16

Period		Description	Remarks
INTR (initial rotation)	From when the COPY START key is pressed until CNTR1 starts.	Stabilizes the sensitivity of the drum in preparation for copying operation. • The drum is rotated first at a low speed and then at a medium or high speed to prevent deformation of the cleaning blade.	• The lens is moved; if the lens fails to reach the specified position within a specified time, INTR is continued until it reaches the position.

Period		Description	Remarks
CNTR1 (control rotation 1)	For about 2 sec after INTR has been completed.	Controls the surface potential (V_D) of the drum.	The scanner motor is rotated counter-clockwise before potential control is executed, thereby returning the scanner to its home position.
CNTR2 (control rotation 2)	For about 3 sec after CNTR1 has been completed.	Controls the surface potential (V_L) of the drum.	The development bias (DC component) is determined for copying operation according to V_L (final measurement). If the copier is to execute AE, AER (AE rotation) is executed after the above.
SCFW (scanner forward)	While the scanner is moving forward. • The distance the scanner moves forward varies depending on the size of the cassette and the reproduction mode. • The speed the scanner moves forward at varies depending on the reproduction mode.	The scanning lamp illuminates the original, and the reflected light is directed to the photosensitive drum by way of mirrors and lens.	• The registration signal is generated, thereby forwarding the copy paper to the transfer assembly. • The pick-up signal is generated, thereby picking up the second copy paper.
SCRV (scanner reverse)	After the scanner has started to move in reverse until the developing assembly clutch goes OFF.	• The scanner is returned to its home position in preparation for the next copy. • The toner on the drum is transferred to the copy paper.	
LSTR (last rotation)	After SCRV has been completed until the main motor goes OFF.	The surface of the drum is cleaned electrostatically to remove residual charge.	The last copy is delivered.

Table 3-3

3. Basic Sequence (two-page separation mode)

In the two-page separation mode, the original on the left side of the copyboard is copied (SCFW1) and then that on the right side is copied (SCFW2).

If a plural number of copies are specified, the original on the left side is first copied in numbers specified; thereafter, the original on the right side is copied in numbers specified.

If AE is executed in the two-page separation mode, the AE mode of the copier is used. As such, the density of the original will be measured over a distance of 105 mm from the leading edge of the original. Based on the measurements, copies are made of the originals on both left and right sides.

Note:

i. If the conditions shown on p. 3-35 are met, potential control rotation (CNTR1, 2) will be executed.
ii. The two-page separation mode is executed only when the copy paper is A4, B5, LTR, or STMT.

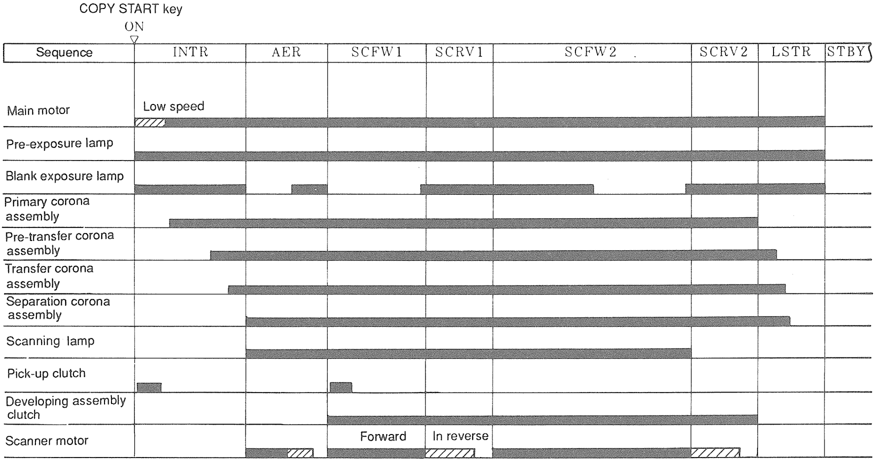


Figure 3-17

Period		Description	Remarks
SCFW1 (scanner forward 1; copying original on left)	While the scanner is moving forward. ∘ The distance the scanner moves forward varies depending on the size of the cassette and the reproduction mode.	The scanning lamp illuminates the original on the left side of the copyboard, and the reflected light is directed to the photosensitive drum by way of mirrors and lens.	∘ The registration signal is generated, thereby forwarding the copy paper to the transfer assembly. ∘ The pick-up signal is generated, thereby picking up the second copy paper.
SCRV1 (scanner reverse 1)	After the scanner has started to move in reverse until the copy paper is delivered.	∘ The scanner is returned to its home position in preparation for the next copy. ∘ The toner on the drum is transferred to the copy paper.	
SCFW2 (scanner forward 2; copying original on right)	While the scanner is moving forward. ∘ The distance the scanner moves forward varies depending on the size of the cassette and the reproduction mode. ∘ The speed the scanner moves forward at varies depending on the reproduction mode.	The scanning lamp illuminates the original on the right side of the copyboard, and the reflected light is directed to the photosensitive drum by way of mirrors and lens.	∘ The registration signal is generated so that the leading edge of the original on the right and the copy paper match based on the SCDP signal.
SCRV (scanner reverse 2)	After the scanner has started to move in reverse until the developing assembly clutch goes OFF.	∘ The scanner is returned to its home position in preparation for the next copy. ∘ The toner on the drum is transferred to the copy paper.	

Note: For sequences other than above, see Table 3-3.

Table 3-4

II. EXPOSURE SYSTEM

A. CHANGING THE REPRODUCTION RATIOS

The reproduction ratio across the drum (axial) is varied by the lens drive system, and that around the drum (circumferential), by the scanner drive system and main drive system.

The lens drive system contains a zoom lens and, as shown in Figure 3-18, the position of the lens and the focal distance are varied to change the reproduction ratio across the drum.

The scanner drive system changes the reproduction ratio around the drum by increasing (for REDUCE) or decreasing (ENLARGE) the speed at which the No. 1 mirror moves.

Note:

i. The mirror is not re-positioned to change the reproduction ratio.

ii. In the DIRECT mode, the speed of the No. 1 mirror and that of the drum (circumferential) are identical.

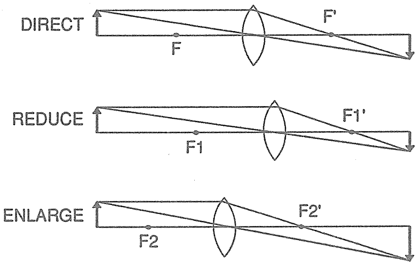


Figure 3-18

B. LENS DRIVE SYSTEM

1. Outline

The lens assembly is driven by the lens drive motor (M3).

When the power is switched ON, the motor always rotates counterclockwise to move the lens to a point at which the signal generating plate shown in Figure 3-19 blocks the lens home position sensor.

When the lens reaches its home position, the motor switches to clockwise rotation and stops after the signal generating plate leaves the sensor and then a specified number of pulses are generated. When the lens moves in the ENLARGE direction, from REDUCE to DIRECT, for example, the motor rotates counterclockwise first, causing the lens to pass the point that corresponds to the reproduction selected; thereafter, the motor starts to rotate clockwise, thereby bringing the lens to the specified point. This consideration is to ensure that the lens stops at the specified point without fail.

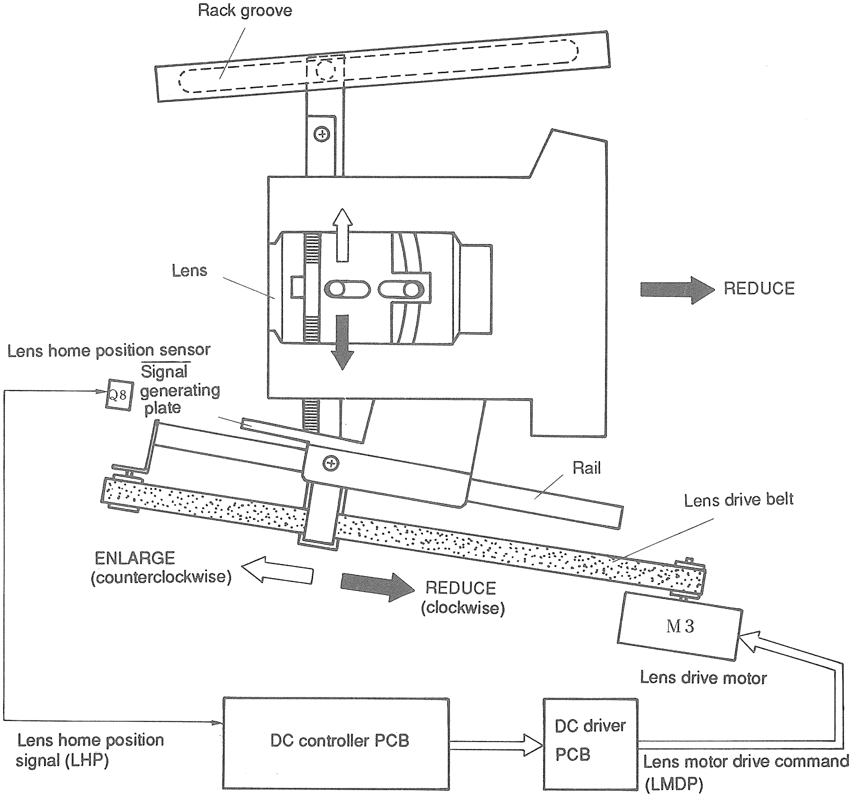

Rack groove
Lens
REDUCE
Lens home position sensor
Q8
Signal generating plate
Rail
Lens drive belt
ENLARGE (counterclockwise)
REDUCE (clockwise)
M3
Lens drive motor
Lens home position signal (LHP)
DC controller PCB
DC driver PCB
Lens motor drive command (LMDP)

Figure 3-19

2. Lens Motor Drive Circuit

While the lens motor is rotating, the motor is driven by 24V power to move the lens.

When the lens motor is at rest, the motor is supplied with 5V power at all times, thereby preventing the lens from shifting its position.

a. Stopping the Lens Motor
- When LMD=0,
  - ↳ Motor drive voltage switching circuit switches to 5V output.
    - ↳ Motor is supplied with 5V power.
      - ↳ Motor goes OFF.

b. Driving the Lens Motor
- When LMD=1,
  - ↳ Motor drive voltage switching circuit switches to 24V output.
    - ↳ Motor is supplied with 24V power.

In this condition, combinations of pulses, $\overline{\text{LMDP1}}$ ($\overline{\text{A}}$) and $\overline{\text{LMDP2}}$ ($\overline{\text{B}}$), cause the motor to rotate clockwise or counterclockwise.

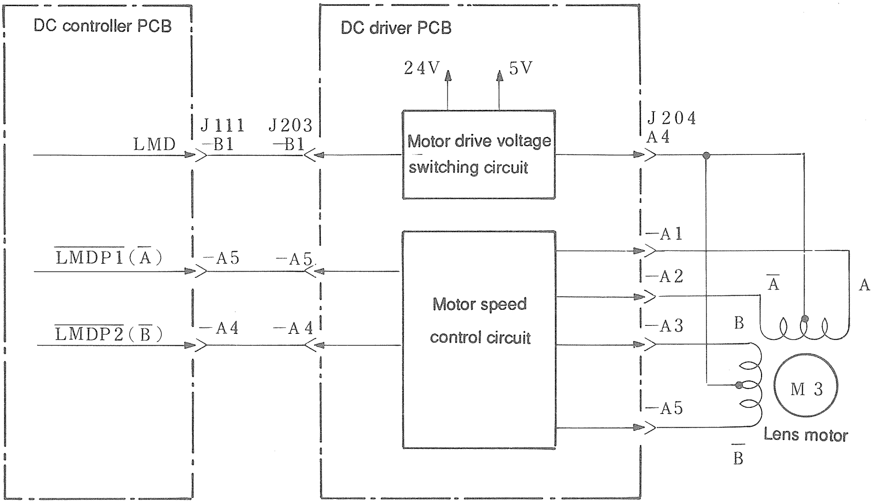

DC controller PCB
DC driver PCB
24V
5V
LMD
J111 -B1
J203 -B1
J204 A4
Motor drive voltage switching circuit
LMDP1 (A)
-A5
-A5
LMDP2 (B)
-A4
-A4
-A1
-A2
-A3
-A5
Motor speed control circuit
A
A
B
B
M 3
Lens motor

Figure 3-20

C. SCANNER DRIVE SYSTEM

1. Outline

The scanner motor is a DC motor with a built-in clock pulse generator.

The scanner motor rotates in opposite directions to move the scanner forward and in reverse; its speed varies when moving the scanner forward depending on the reproduction ratio selected.

The motor rotates at a constant speed when moving the scanner in reverse; it rotates 2.5 times as fast as when it moves the scanner forward. When the signal generating plate reaches the photointerrupter (Q2), the motor is braked to stop the scanner at its home position.

The distance over which the scanner moves varies depending on the size of the copy paper and the reproduction ratio selected.

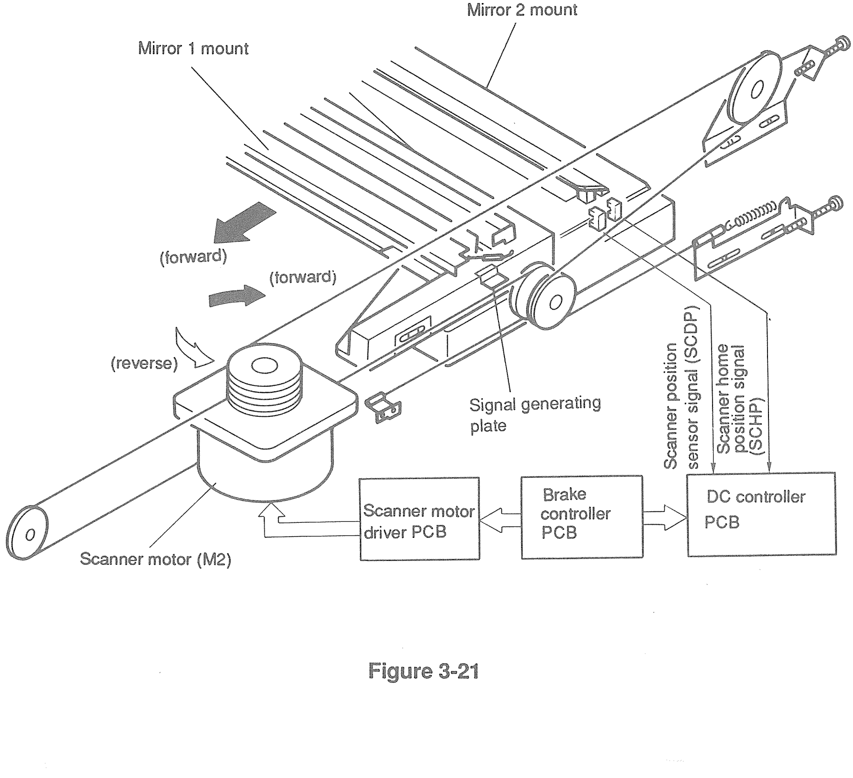

Mirror 2 mount
Mirror 1 mount
(forward)
(forward)
(reverse)
Signal generating plate
Scanner position sensor signal (SCDP)
Scanner home position signal (SCHP)
Scanner motor driver PCB
Brake controller PCB
DC controller PCB
Scanner motor (M2)

Figure 3-21

2. Relationship Between Scanner Sensors and Signals

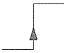
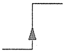
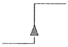
Scanner sensor	Signal	Scanner		Description
		Forward	In reverse	
Q1	SCHP			The scanner is at its home position.
				The scanner motor is OFF.
Q2	SCDP			The copier starts AE measurement after 11 clock pulses. The copier ends AE measurement after 60 clock pulses.
				Reference for the registration; several seconds later, the registration clutch goes ON.
				Reference for the distance the scanner moves forward; the distance varies depending on the size of the copy paper and the reproduction ratio selected.
				Reference for the point at which the blank exposure lamp goes ON; the point varies depending on the size of the copy paper and the reproduction ratio selected.
				The scanner motor starts braking.

Table 3-5

3. Sequence for Scanner Movement

The distance over which the scanner moves forward is determined by the microprocessor based on the size of the copy paper, reproduction ratio selected, and the copy mode selected.

Based on the reproduction ratio selected, the microprocessor computes the size of the original that can be covered by the selected copy paper to determine the distance.

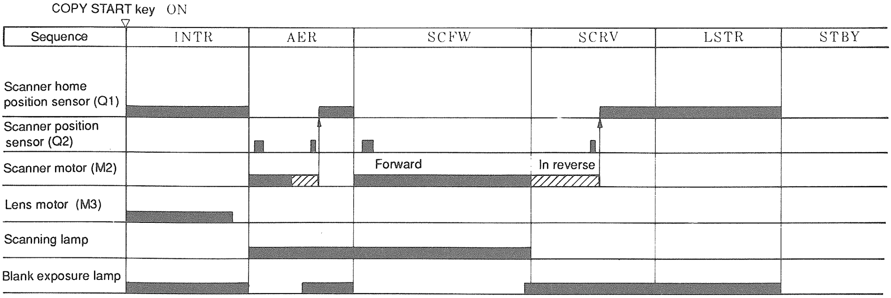

COPY START key ON
Sequence
INTR
AER
SCFW
SCRV
LSTR
STBY
Scanner home position sensor (Q1)
Scanner position sensor (Q2)
Scanner motor (M2)
Forward
In reverse
Lens motor (M3)
Scanning lamp
Blank exposure lamp

Figure 3-22

4. Controlling the Scanner for the Two-Page Separation Mode

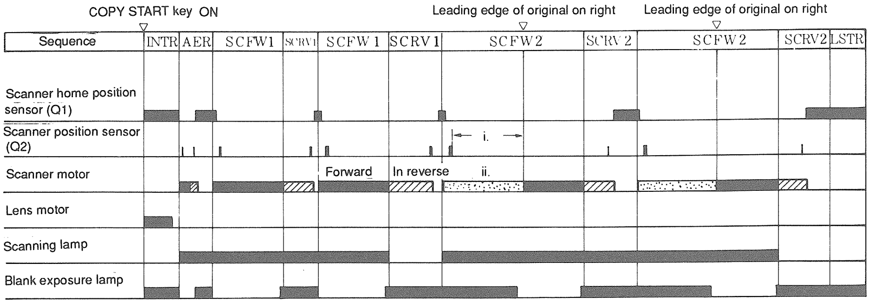
In the two-page separation mode, the originals on the copyboard glass are divided into two to produce copies.

a. When copying the original on the left side of the copyboard glass, the scanner is controlled by the sequence used to control copying on A4, B5, LTR, or STMT paper.

b. When copying the original on the right side of the copyboard glass, the scanner is controlled based on the distance over which the scanner has moved when copying the original on the left side of the copyboard glass; see Table 3-6.

Case	Movement of scanner when copying original on left	Leading edge of original on right	Movement of scanner when copying original on right (distance from SCDP)
1	Less than 210 mm/8.5 in.	Point at which scanner reverses when copying original on left	Distance twice that over which scanner has moved when copying original on left
2	210 mm/8.5 in. or more	210 mm/8.5 in. (approx., fixed)	Same distance over which scanner moves when copying on A3/LDG (440 mm/17 in., approx.; DIRECT)

Table 3-6


COPY START key ON
Leading edge of original on right
Leading edge of original on right
Sequence
INTR
AER
SCFW1
SCRV1
SCFW 1
SCRV1
SCFW2
SCRV 2
SCFW2
SCRV2
LSTR
Scanner home position sensor (Q1)
Scanner position sensor (Q2)
i.
Scanner motor
Forward
In reverse
ii.
Lens motor
Scanning lamp
Blank exposure lamp

i Varies depending on distance scanner moved when copying original on left; see Table 3-6.
ii Moves scanner to leading edge of original on right.

Figure 3-23

5. Controlling the Scanner Motor

a. Outline
Figure 3-24 is the circuit that controls the scanner motor and has the following functions:

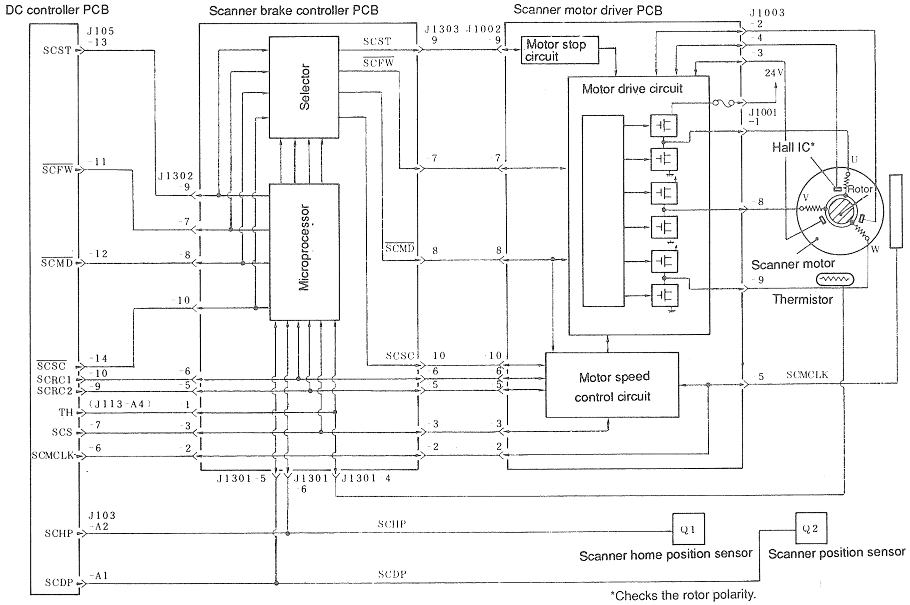
① Turns the scanner motor ON and OFF.
② Controls the direction of the scanner motor.
③ Controls the speed of the scanner motor.

b. Stopping the Motor
When the scanner motor drive command (SCMD) is '1', the drive circuit goes OFF, causing the motor to remain at rest.

c. Moving the Scanner Forward
When the scanner motor drive command (SCMD) is '0' and the scanner forward command (SCFW) is '0', the drive circuit goes ON, causing the scanner motor to rotate clockwise.

d. Moving the Scanner in Reverse
When the scanner motor drive command (SCMD) is '0' and the scanner forward command (SCFW) is '1', the drive circuit goes ON, causing the scanner motor to rotate counterclockwise.

e. Controlling the Speed of the Scanner Motor
The microprocessor on the DC controller PCB sends the scanner speed pulses (SCS) suited to the reproduction ratio selected to the scanner motor driver PCB. The speed control circuit compares the scanner speed pulses and the clock pulses (SCMCLK) generated by the scanner motor and, in turn, sends control signals suited to the difference between the two to the motor dive circuit.


DC controller PCB
Scanner brake controller PCB
Scanner motor driver PCB
J105
SCST
SCFW
SCMD
SCSC
SCRC1
SCRC2
TH
SCS
SCMCLK
(J113-A4)
J1302
J1303
J1002
J1003
J1001
J1301-5
J1301-6
J1301-4
J103
SCHP
SCDP
Selector
Microprocessor
Motor stop circuit
Motor drive circuit
Motor speed control circuit
24V
Hall IC*
Rotor
U
V
W
Scanner motor
Thermistor
Q1
Q2
Scanner home position sensor
Scanner position sensor

*Checks the rotor polarity.

Figure 3-24

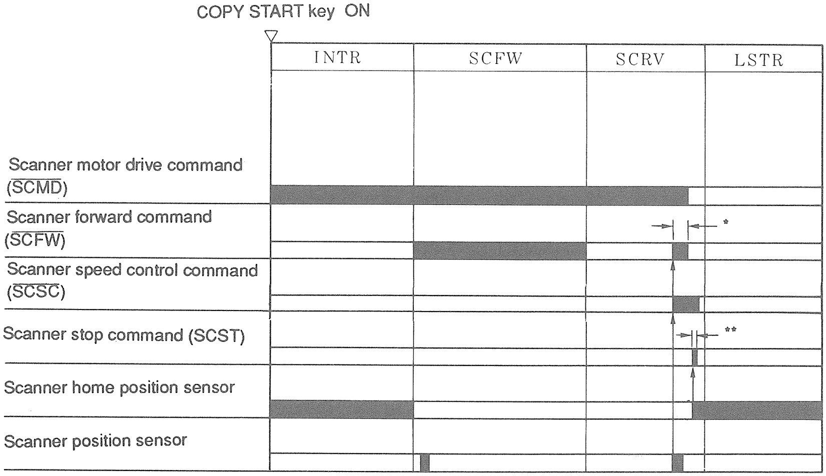
The motor drive circuit controls the speed of the motor by varying the ON/OFF intervals at which the motor is supplied with power; i.e., the voltage applied to the motor remains constant.

To vary the speed of the scanner motor, the DC controller generates the reproduction ratio select commands (SCRC 1, 2) as follows.

If the scanner motor overheats, the thermistor built into the scanner motor checks the condition, causing the brake controller (microprocessor) to increase the brakes.

Copier	SCRC1	SCRC2
Scanner forward (130% to 142% ratio)	1	0
Scanner forward (64% to 129%)	0	1
Scanner reverse	1	1

Table 3-7


COPY START key ON
INTR
SCFW
SCRV
LSTR
Scanner motor drive command (SCMD)
Scanner forward command (SCFW)
Scanner speed control command (SCSC)
Scanner stop command (SCST)
Scanner home position sensor
Scanner position sensor
*
**

* Scanner decelerates.
* Scanner stops.

Figure 3-25

f. Brake Circuit
When the signal generating plate blocks the scanner position sensor (Q2) while the scanner is moving in reverse, the scanner speed control command (SCSC) goes '0', causing the scanner motor to be free of speed control. At the same time, the scanner motor rotates to move the scanner forward, and the scanner is braked.
When the signal generating plate of the scanner blocks the scanner home position sensor (Q1), the scanner stop command (SCST) goes '1', bringing the scanner to a complete stop.
The scanner brake control PCB is used to improve the accuracy of braking. Normally, the microprocessor on the brake control PCB controls the braking mechanism; should an error occur, however, the selector switches to control by the DC controller PCB.

Note:

If the scanner brake control PCB fails, the microprocessor on the DC controller assumes control of the braking mechanism.

As the degree of braking is fixed, a fault in the scanner brake control PCB can result in the following:

① The copying speed slows down.
② The brakes may become weak.
③ The brakes may become too strong.

g. Error Detection
Should the motor suffer an excessive load for some reason, the fuse attached to the scanner motor driver will blow off, thereby causing the motor drive circuit to go OFF. At the same time, the DC controller detects an error in the clock pulses from the scanner motor and indicates E203 in the display on the control panel.

III. IMAGE FORMATION SYSTEM

A. CONTROLLING THE DRUM SURFACE POTENTIAL

1. Outline

Changes in the electrostatic latent image lead to changes in the copy image; the following are some of the causes of such changes:

① Changes in the drum sensitivity;
② Changes in the charge from the primary corona assembly; and
③ Changes in the degree of exposure.

The above changes come about in relation to the environment in which the machine is installed (temperature, humidity) or because of deteriorating or soiled parts.

So as to limit the effects of these changes, and thereby ensuring stable latent images, the copier is equipped with a drum surface potential control mechanism.

The mechanism changes the light area target potential (V_{L1}), dark area target potential (V_D), and control coefficient to suit the changes that occur in the drum sensitivity to obtain optimum image output.

Note:

The light area target potential, dark area target potential, and control coefficient are recorded on the settings sheet that comes with the drum; and the settings are adjusted only at time of drum replacement.

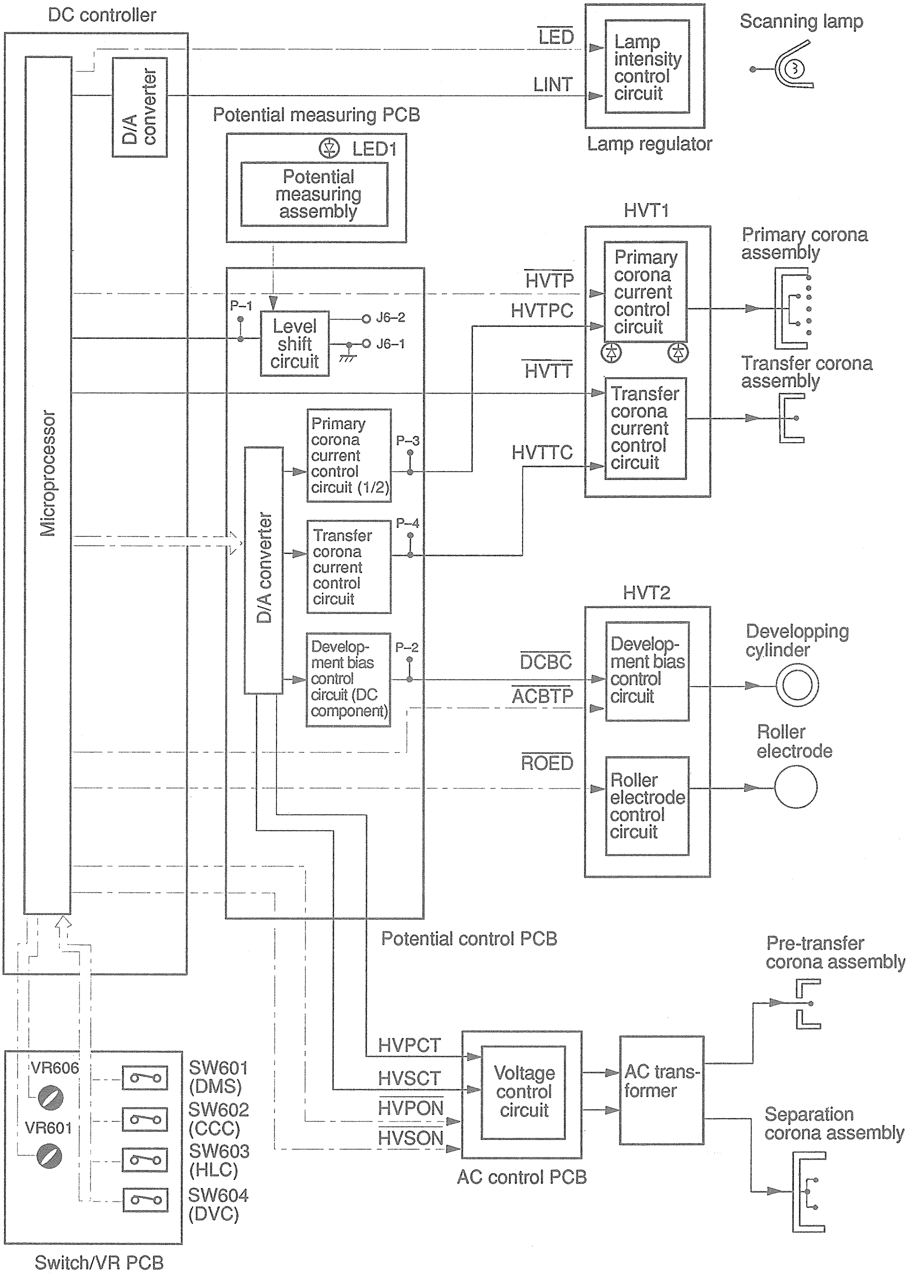

DC controller
D/A converter
Microprocessor
LED
LINT
Lamp intensity control circuit
Lamp regulator
Scanning lamp
③
Potential measuring PCB
LED1
Potential measuring assembly
P-1
Level shift circuit
J6-2
J6-1
HVT1
Primary corona assembly
HVTP
HVTPC
Primary corona current control circuit
HVTT
Transfer corona current control circuit
Transfer corona assembly
Primary corona current control circuit (1/2)
P-3
HVTTC
D/A converter
Transfer corona current control circuit
P-4
HVT2
Develop-ment bias control circuit (DC component)
P-2
DCBC
ACBTP
Develop-ment bias control circuit
Developping cylinder
Roller electrode
ROED
Roller electrode control circuit
Potential control PCB
Pre-transfer corona assembly
HVPCT
HVSCT
HVPON
HVSON
Voltage control circuit
AC trans-former
AC control PCB
Separation corona assembly
VR606
VR601
SW601 (DMS)
SW602 (CCC)
SW603 (HLC)
SW604 (DVC)
Switch/VR PCB

Figure 3-26 Surface Potential Control

2. Control Mechanism

Table 3-8 shows the number of measurements and corrections made for potential control.

	Measurements	Corrections
V_D	3	3
V_{L1}	3	3
V_{L2}	1	0

Table 3-8

a. Controlling the Primary Corona Current
To measure the dark area potential (V_D), a reference current is sent to the primary corona assembly, and the potential sensor is used to measure the surface potential of the drum. Based on the measurements, a comparison is made against the target value; if a discrepancy is noted, the primary corona level control signal (HVTPC) generated by the DC controller PCB is corrected.
The corrected current is then sent from the high-voltage transformer (HVT1) to the primary corona assembly.
This series of measurements and corrections is repeated three times to bring the dark area potential (V_D) closer to the target value.

b. Controlling the Scanning Lamp Intensity
To measure the light area potential (V_{L1}), a reference ON voltage is applied to the scanning lamp.
The scanning lamp illuminates the standard white plate, and the reflected light is directed to the drum.
The surface potential of the drum where the reflected light is directed is measured, and the measurements are sent to the DC controller PCB. The DC controller, in turn, compares the measurements against the target value and, if a discrepancy is found, it corrects the light intensity control signal (LINT) it generates.
The corrected voltage is then sent by the lamp regulator to the scanning lamp.
This series of measurements and corrections is repeated three times to bring the light area potential (V_{L1}) closer to the target value.

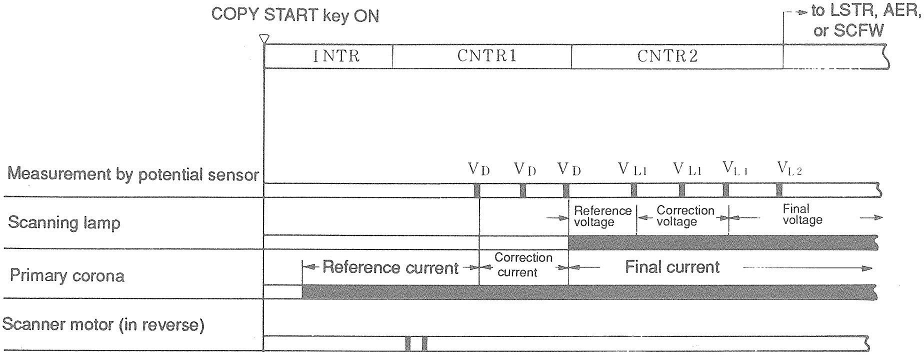

COPY START key ON
to LSTR, AER, or SCFW
INTR
CNTR1
CNTR2
Measurement by potential sensor
VD
VD
VD
VL1
VL1
VL1
VL2
Scanning lamp
Reference voltage
Correction voltage
Final voltage
Primary corona
Reference current
Correction current
Final current
Scanner motor (in reverse)

Figure 3-27

c. Controlling the Development Bias
The light area potential (V_{L2}) for the development bias causes the scanning lamp to go ON to measure the surface potential of the drum based on the final intensity control signal.
The measurements are in turn used by the DC controller PCB to control the development bias DC level control signal (DCBC), which is generated by the high-voltage transformer and applied to the developing cylinder.

d. Executing Potential Control
The potential control rotation (CNTR1, 2) is not executed for each copy run but, instead, is executed when the following conditions are met.

Reproduction ratio	90% to 142%	64% to 89%
Period shorter than between power-on and 10 min thereafter	Executed at power-on.	Executed at first press on COPY START key; regardless of reproduction ratio if between 64% and 89% (not executed at second or subsequent power-on).
Period between 10 min after power-on and less than 60 min	Executed at first press on COPY START key; regardless of reproduction ratio if between 90% and 142% (not executed at second or subsequent power-on).	
Period 60 min after power-on		

Table 3-9

3. Potential Measuring Circuit

Figure 3-28 is a block diagram that shows the potential measuring circuit.

Charges corresponding to the surface potential of the drum is induced on the electrode within the sensor and sent as alternating voltage to the pre-amplifier within the sensor as the choppers open and close. The voltage, after amplification, is sent to the filter/gain control circuit within the surface potential measuring PCB.

The filter/gain control circuit removes electrical noises from the AC signal coming from the pre-amplifier of the sensor and, after amplification, sends it to the sync clamp circuit by way of a photocoupler.

The sync clamp circuit combines the AC signal coming from the filter gain control circuit and the sync signal from the sync signal control signal and determines whether the surface potential is positive or negative.

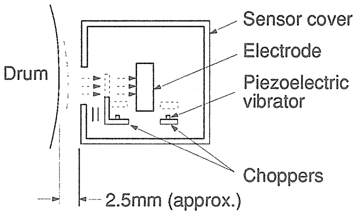

Sensor cover
Electrode
Drum
Piezoelectric vibrator
Choppers
2.5mm (approx.)

Figure 3-29

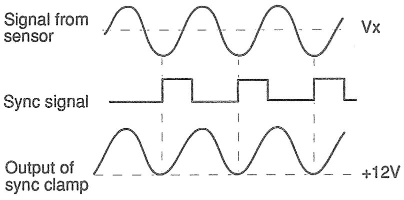

Signal from sensor
Vx
Sync signal
Output of sync clamp
+12V

Figure 3-30 Surface Potential is Higher Than Sensor Bias

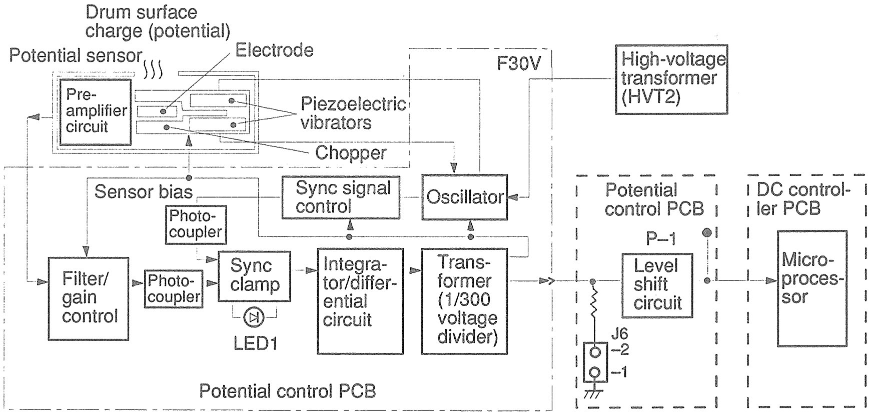

Drum surface charge (potential)
Potential sensor
Electrode
Pre-amplifier circuit
Piezoelectric vibrators
Chopper
F30V
High-voltage transformer (HVT2)
Sensor bias
Photo-coupler
Sync signal control
Oscillator
Filter/gain control
Photo-coupler
Sync clamp
LED1
Integra-tor/differ-ential circuit
Trans-former (1/300 voltage divider)
Potential control PCB
Potential control PCB
P-1
Level shift circuit
J6
-2
-1
DC controller PCB
Micro-proces-sor

Figure 3-28

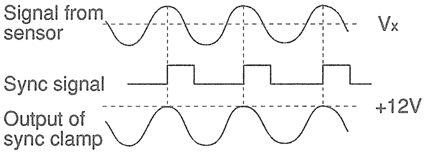


Figure 3-31 Surface Potential is Lower than Sensor Bias

The output of the sync clamp circuit is processed by the integrator and amplified; it is then applied to the transformer. According to the signal, the output of the transformer varies between 0 V and +600 V; it is applied to the sensor as a sensor bias and, at the same time, is lowered to about 1/300 and sent to the level shift circuit of the potential control PCB.

The level shift circuit converts the 0V-reference signal it receives to a 0.25V-reference signal while amplifying it 200%.

The level shift circuit output signal (analog) is sent to the microprocessor on the DC controller PCB as it is.

a. Checking

① LED1

LED 1 normally goes ON when the main motor is rotating; otherwise, the F30V power may be absent or the potential measuring unit may be faulty.

Note:

If LED1 is ON, the potential sensor is functioning normally.

② Using Check Pins

- The voltage of P1 on the potential control PCB is 0.25 + surface potential 150 (V) for P5-reference.
- J6-1 and J6-2 on the potential control PCB is used to determine the condition of the potential measuring unit; for details, see the SERVICE HANDBOOK.

Note:

The sensor and potential measuring PCB need to be adjusted as a pair, and they cannot be adjusted in the field. The sensor and potential measuring PCB therefore are treated as a single part and called *potential measuring unit.*

The potential measuring PCB and potential control PCB are equipped with a variable resistor; do no, however, use it in the field.

B. CONTROLLING THE INTENSITY OF THE SCANNING LAMP

1. Outline

Figure 3-32 shows the circuit which controls the intensity of the scanning lamp and has the following functions:

① Turns the scanning lamp ON and OFF.

② Controls the intensity of the scanning lamp.

- It keeps the intensity constant against fluctuations in the power supply voltage.
- It controls the intensity in response to the shifts in the sensitivity of the drum.
- It controls the intensity in response to the setting made by the DENSITY CONTROL key.
- It controls the intensity in response to the density of the original (AE control).
- It lowers the supply voltage to the scanning lamp to 0.91 of the normal voltage when making copies reduced to between 89% and 64%.

2. Mechanism

a. Turning the Scanning Lamp ON and OFF

When $\overline{\text{LRD}}$ (lamp regulator drive command) is '1', the output of the lamp regulator switching circuit goes '0'; as a result, the phase control circuit is deprived of power, causing the triac triggering circuit to go OFF and, then, the scanning lamp (LA1) to go OFF.

When $\overline{\text{LRD}}$ is '0', the output of the lamp regulator switching circuit goes '1'; as a result, the phase control circuit is supplied with power, causing the triac triggering circuit to to ON and, then, the scanning lamp (LA1) to go ON.

b. Controlling the Intensity of the Scanning Lamp

The intensity of the scanning lamp is increased or decreased by controlling the voltage of the power supplied to the scanning lamp based on the value of the intensity control signal (LINT) generated by the DC controller.

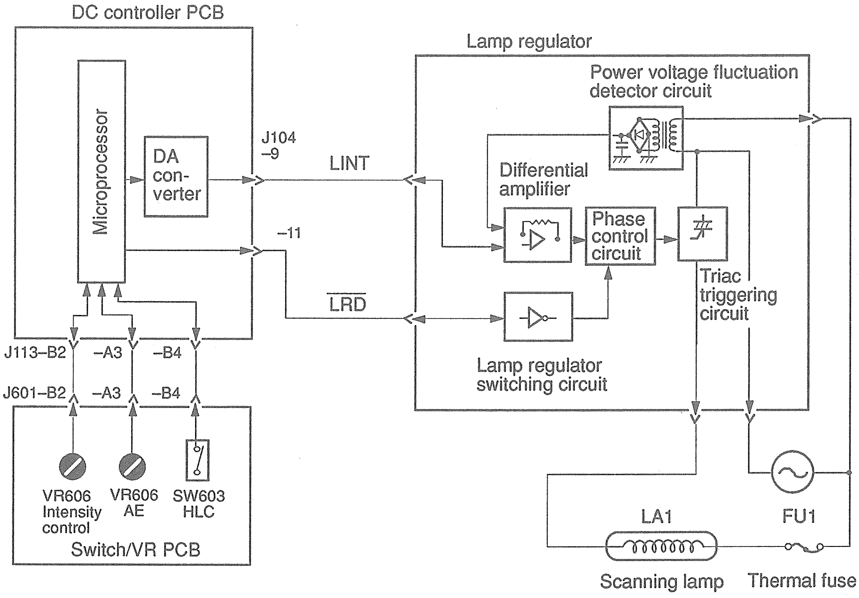

DC controller PCB
Microprocessor
DA converter
J104 -9
-11
LINT
LRD
J113-B2
-A3
-B4
J601-B2
-A3
-B4
VR606 Intensity control
VR606 AE
SW603 HLC
Switch/VR PCB
Lamp regulator
Power voltage fluctuation detector circuit
Differential amplifier
Phase control circuit
Triac triggering circuit
Lamp regulator switching circuit
LA1
FU1
Scanning lamp
Thermal fuse

Figure 3-32

The LINT signal varies between 10 V and 16 V to accommodate the setting of the DENSITY CONTROL key, density of the original, sensitivity of the drum, and setting of the intensity control VR; the signal thus exerts phase control so that the voltage of the power supplied to the scanning lamp will vary between 45 V and 80 V in effective terms.

When making copies reduced to 89% through 64%, the voltage applied to the scanning lamp is lowered to 0.91, thereby lowering the intensity of light directed to the drum.

In the photo mode, the voltage applied to the scanning lamp is lowered by 5 V, thereby lowering the intensity of the light directed to the drum.

3. Automatic Exposure

The copier is equipped with an automatic exposure mechanism (AE) that controls the intensity of the scanning lamp according to the density of the original.

When copies are made in the AE mode, the operator need not change the density of the copy to suit the original to obtain fog-free copies. The intensity of the lamp controlled in the AE mode can be checked by the display on the control panel.

Automatic exposure may be executed by the copier or by the RDF; the latter is used when the original is set in the RDF.

① AE Mode of the Copier (CMAE)
The scanning lamp is caused to go ON during AE rotation (AER), and the scanner is moved 105 mm forward.
While the original is illuminated, the surface potential of the seven points shown in Figure 3-33 is measured, and the measurements are sent to the DC controller PCB.
The DC controller PCB, in turn, computes an average of the measurements of the surface potential and determines the intensity of the scanning lamp for copying operation.

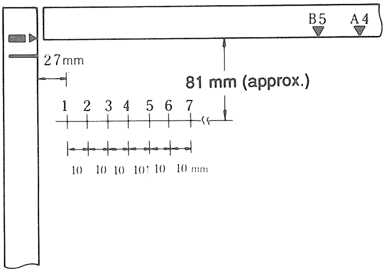


Figure 3-33 (DIRECT)

② AE Mode of the RDF (RFAE)
The density of the original is measured while the RF picks up the original.

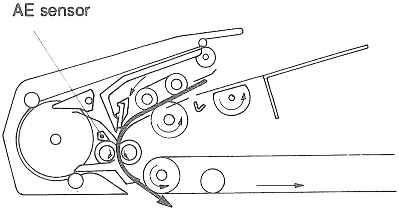


Figure 3-34

The density of the original is measured at the five points shown in Figure 3-35 (by RF), and the measurements are sent to the copier's DC controller. The DC controller, in turn, determines the intensity of the scanning lamp for copying operation using the measurements.

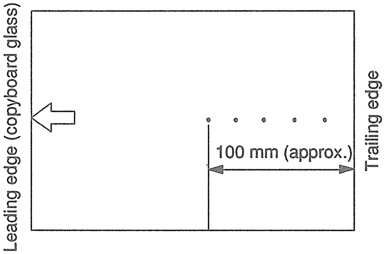


Figure 3-35 Points of Measurement (on original)

Figure 3-36 shows changes in the intensity at which the original is illuminated in relation to the density of an original. If the density of the original is higher than the Test Sheet yet lower than a newspaper, the intensity of illumination changes within F5 through F9 of the DENSITY CONTROL indication. If the original is lighter than the Test Sheet, the intensity will equal F5; if darker than a newspaper, on the other hand, the intensity will equal F9 when making copies.

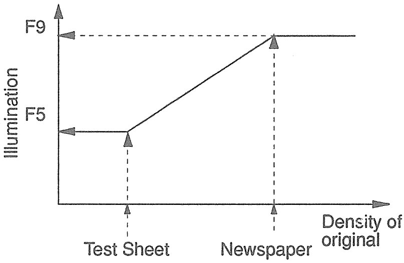


Figure 3-36

4. Check Points

① Checking the Voltage on J104-9 (LINT)
Shift SW603 (HLC switch) of the switch/VR PCB to 'OFF'. The voltage during copying operation at J104-9 and J-104-10 (0V) will reflect the setting of VR606, thereby varying the voltage in response to a press on the DENSITY CONTROL key.

② Checking the Voltage on J104-7 ($\overline{\text{LRD}}$)
The voltage of J104-7 and J104-10 (0 V) while the scanner is moving forward is about 0 V and about 16 V at other times.

5. VR for Intensity Control

For adjustment of VRs (VR606, VR601) for intensity control, see the SERVICE HANDBOOK; Table 3-10 shows the function of each VR.

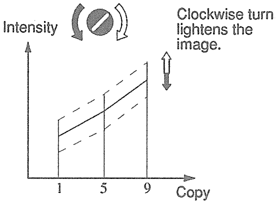
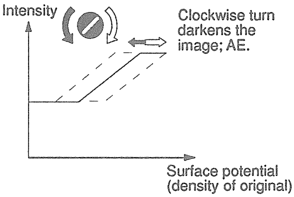
VR	VR606	VR601
Function	Optimum exposure adjustment (during copying operation)	Optimum image adjustment (AE F5 of copier)
Description		

Table 3-10

Note:

Deterioration of the photosensitive drum calls for adjustment of VR606; if the setting of VR606 is not proper, the following can occur:

- In the manual mode, the copy density indication at which optimum exposure can be expected will be other than '±1' when the Test Sheet is copied.
- In the AE mode, the copy density will not be optimum when the Test Sheet is copied. Further, turning SW603 on the switch/VR PCB OFF deactivates intensity control.

C. CONTROLLING THE BLANK EXPOSURE LAMP (LED)

1. Outline

The blank exposure lamp consists of 57 LEDs, and it is controlled to accommodate the type of cassette used, reproduction ratio selected, and frame erasing mode.

2. Making REDUCE Copies

When making REDUCE copies, the number of LEDs (rear) suited to the reproduction ratio selected are turned ON to white out the non-image area.

3. Making DIRECT Copies

When making DIRECT copies, the number of LEDs (rear) suited to the size of the cassette are turned ON to white out the area of the copy paper that will not come into contact with the drum.

When making copies at a standard reproduction ratio or in the DIRECT mode using copy paper of a standard size, a non-image area is created on the rear and front sides of the image across a width of about 2.5 mm; this operation is called standard frame erasing.

In the service mode, the width (about 2.5 mm) may be changed to 0 mm.

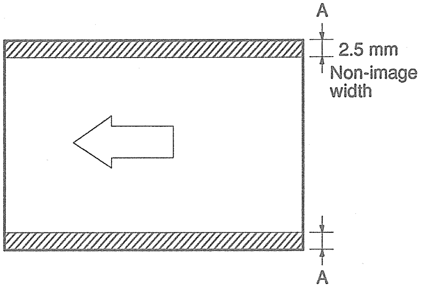


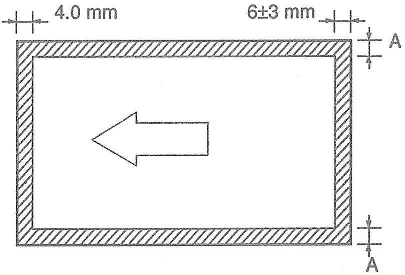
Figure 3-37

4. Controlling the LEDs for Sheet Frame Erasing

In the sheet frame erasing mode, LEDs are kept ON so as to prevent adhesion of toner around the copy paper.

Note:

In the manual mode, sheet frame erasing will be executed based on A3/LDG size copy paper; when the universal cassette is used, sheet frame erasing will be based on the maximum copy paper size the cassette can accommodate.



A = 8.5 mm (approx.)

Figure 3-38 Sheet Frame Erasing ON

D. CONTROLLING THE PRIMARY/TRANSFER CORONA CURRENT

1. Outline

Figure 3-39 is the circuit that controls the primary/transfer corona current and has the following functions.

① Turns the primary corona currents ON and OFF.
② Maintains the primary corona current constant.
③ Turns the transfer corona current ON and OFF.
④ Switches values of the transfer corona current.

2. Controlling the Primary Corona Current

The DC controller PCB compares the surface potential of the drum (V_D) obtained by the potential measuring circuit and the target potential; if it finds a discrepancy, it corrects the signal generated by the DC controller PCB to control the primary corona current.

The corrected signal is converted into analog signals and sent to the high-voltage transformer, thereby controlling the primary corona current.

a. Primary High-Voltage Transformer is OFF

$\overline{HVTP}=1$

- → LED1 glows at low intensity.
- → Switching circuit goes OFF.
  - → Differential amplifier goes OFF.
    - → Primary high-voltage transformer goes OFF.
    - → LED3 goes OFF.

b. Primary High-Voltage Transformer is ON

$\overline{HVTP}=0$

- → LED1 glows at high intensity.
- → Switching circuit goes ON.
  - → Differential amplifier goes ON.
    - → Primary high-voltage transformer goes ON.
    - → LED3 goes ON.

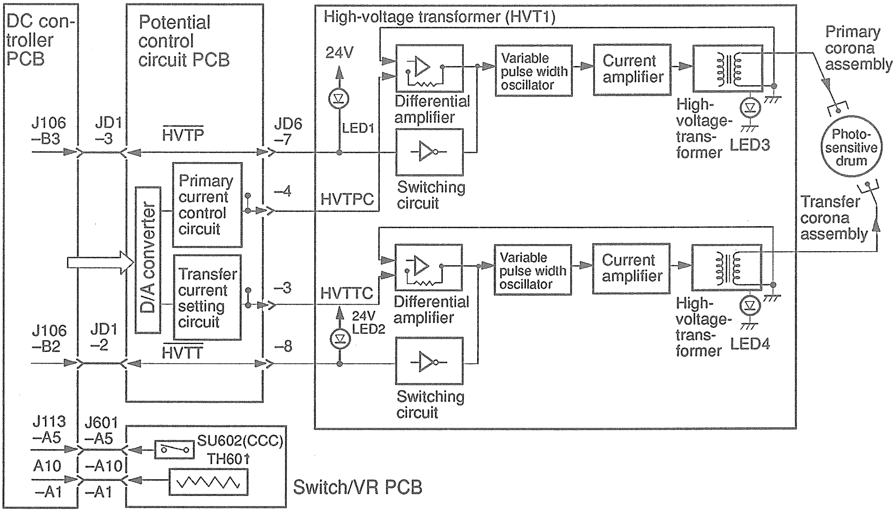

DC controller PCB
Potential control circuit PCB
High-voltage transformer (HVT1)
J106 -B3
JD1 -3
HVTP
JD6 -7
24V
LED1
Differential amplifier
Variable pulse width oscillator
Current amplifier
High-voltage-transformer
LED3
Primary corona assembly
Photo-sensitive drum
Switching circuit
-4
HVTPC
Primary current control circuit
D/A converter
Transfer current setting circuit
-3
HVTTC
24V
LED2
Transfer corona assembly
LED4
J106 -B2
JD1 -2
HVTT
-8
J113 -A5
J601 -A5
A10
-A10
-A1
-A1
SU602(CCC)
TH601
Switch/VR PCB

Figure 3-39

In this condition, the high-voltage transformer sends high voltage corresponding to the output of the primary corona level control signal (HVTPC) to the primary corona assembly.

If excessive corona current flows from the primary corona assembly because of changes in the environment, the feedback signal to the differential amplifier increases; since the decreases that occur in the output as a result decrease the corona current, the current is maintained constant.

In the photo mode, the primary corona output is controlled according to the reproduction ratio selected: if the reproduction ratio is between 141% and 90%, the output will be 0.73 times as great as the normal output; if between 89% and 64%, the output will be 0.7 times as great as the normal output.

Note:

The mechanism that controls the primary corona current may be turned OFF by switching SW602 on the switch/VR PCB OFF.

3. Controlling the Transfer Corona Current

The transfer efficiency that affects transfer of toner from the photosensitive drum to copy paper is affected by changes in the environment, e.g., temperature and humidity.

The mechanism that controls the current maintains the discharge from the transfer corona assembly constant so that the density of the copy will be more or less uniform. Changes in the environment, however, can cause the overall density of the copy to become lighter or darker.

To counter such changes in the density, the temperature inside the machine is monitored and the findings are used to vary the transfer current.

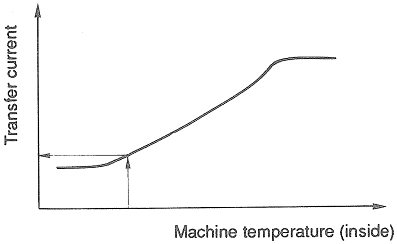


Figure 3-40

a. Transfer High-Voltage Transformer is OFF

$\overline{\text{HVTT}}$=1
- → LED2 glows at low intensity.
- → Switching circuit goes OFF.
  - → Differential amplifier goes OFF.
    - → Transfer high-voltage transformer goes OFF.
    - → LED4 goes OFF.

b. Transfer High-Voltage Transformer is ON

HVTT=0
- → LED2 glows at high intensity.
- → Switching circuit goes ON.
  - → Differential amplifier goes ON.
    - → Transfer high-voltage transformer goes ON.
    - → LED4 goes ON.

In this condition, the high-voltage transformer sends high voltage corresponding to the output of the transfer corona level control signal (HVTTC) to the transfer corona assembly.

If excessive corona current flows from the transfer corona assembly because of changes in the environment, the feedback signal to the deferential amplifier increases; since the decreases that occur in the output as a result decrease the corona current, the current is maintained constant.

E. CONTROLLING THE SEPARATION/PRE-TRANSFER CORONA CURRENT

1. Outline

Figure 3-43 shows the circuit that controls the separation corona current and pre-transfer corona current and has the following functions.

① Turns the separation/pre-transfer corona current ON and OFF.
② Switches the separation corona current.
③ Maintains the separation corona current constant.
④ Switches the pre-transfer corona current.
⑤ Maintains the pre-transfer corona current.

The DC component of the separation corona assembly and pre-transfer corona assembly is maintained constant using sample signals taken from the secondary side of the high-voltage transformer, thereby freeing it of the effects of corona discharge caused by changes in the environment; the output of the AC transformer is maintained constant.

To limit the effects of the environment further, the temperature inside the machine and the surface potential of the drum during copying operation are monitored and the findings are used to vary the separation corona current.

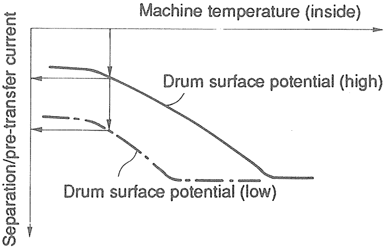


Figure 3-41

In addition, the measurements taken of the temperture inside the machine are used to vary the pre-transfer corona current.

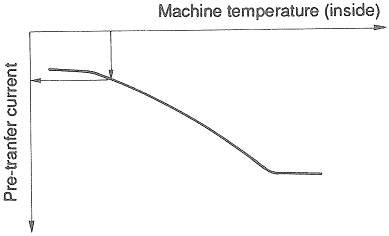


Figure 3-42

2. Controlling the Separation Corona Current

a. Separation High-Voltage Transformer is OFF
When $\overline{HVSON}$=1, the DC component and AC component of the separation corona will not be supplied.

b. Separation High-Voltage Transformer is ON
When $\overline{HVSON}$=0, the output of the power control circuit (Q1) is sent to the transformer, generating the DC component of the separation corona.
At the same time, the AC transformer goes ON, sending the DC component and AC component to the separation corona assembly.

c. Switching the Separation Corona Current
The digital signals from the DC controller is converted to analog signals (HVSCT) by the potential control circuit to control the current.

3. Controlling the Pre-Transfer Corona Current

a. Pre-Transfer High-Voltage Transformer is OFF

When $\overline{\text{HVPON}}$=1, the DC component and AC component of the pre-transfer corona will not be supplied.

b. Pre-Transfer High-Voltage Transformer is ON

When $\overline{\text{HVPON}}$=0, the output of the power control circuit (Q1) is sent to the transformer, generating the DC component of the pre-transfer corona. At the same time, the AC transformer goes ON, sending the DC component and AC component to the pre-transfer corona assembly.

c. Switching the Pre-Transfer Corona Current

When $\overline{\text{HVPON}}$=0, the digital signals from the DC controller PCB is converted to analog signals (HVPCT) by the potential control circuit, thereby controlling the current.

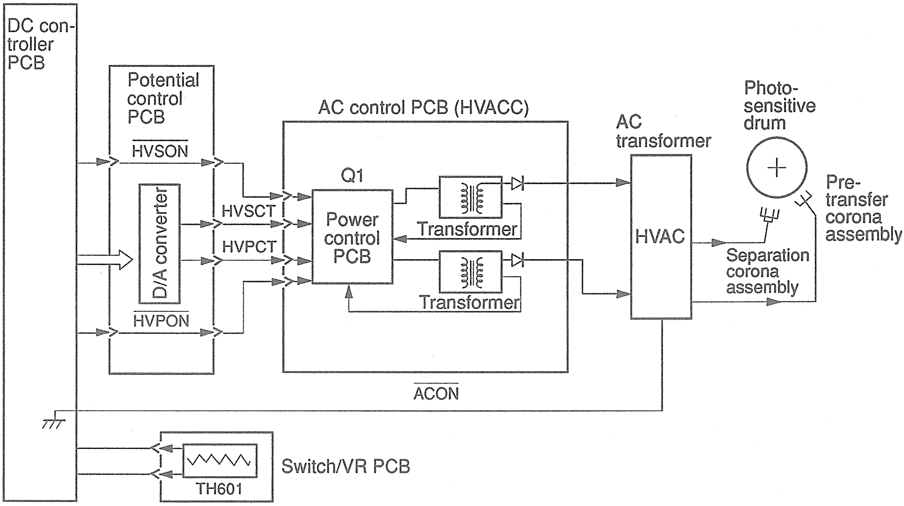

DC controller PCB
Potential control PCB
HVSON
D/A converter
HVPON
AC control PCB (HVACC)
HVSCT
HVPCT
Q1
Power control PCB
Transformer
Transformer
AC transformer
HVAC
Photo-sensitive drum
Pre-transfer corona assembly
Separation corona assembly
ACON
Switch/VR PCB
TH601

Figure 3-43

F. DEVELOPING ASSEMBLY AND CLEANING UNIT

1. Outline

The developing assembly is driven by the main motor; the drive of the motor is transmitted or interrupted by the developing assembly clutch (CL5).

The cleaning unit also receives the drive of the main motor through drum gear.

The toner inside the developing assembly is monitored by the toner level circuit and, when its amount falls below the specified amount, the hopper unit starts to supply the assembly with toner.

The toner inside the hopper unit is monitored by the toner sensor (Q7); when its amount falls below the specified amount, the ADD TONER message will be indicated on the control panel.

The developing assembly is supplied with toner from the hopper unit by the hopper motor (M5). Normally, the hopper motor rotates in clockwise direction and stirs the toner. When it supplies the developing assembly with toner, it rotates in counterclockwise direction, while at the same time stirring the toner inside it.

The toner scraped off by the cleaning blade is forwarded to the front of the copier by the screw inside the cleaning unit. The waste toner so collected is then sent to the waste toner receptacle by the waste toner feed motor (M8).

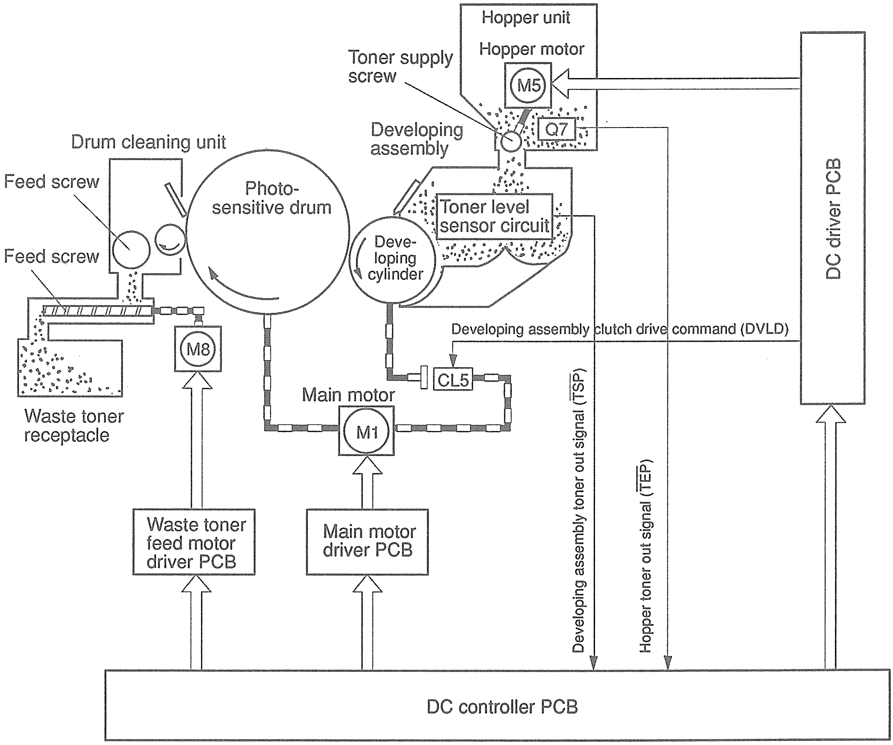

Hopper unit
Hopper motor
M5
Toner supply screw
Q7
Developing assembly
Drum cleaning unit
Feed screw
Photo-sensitive drum
Toner level sensor circuit
Feed screw
Deve-loping cylinder
DC driver PCB
Developing assembly clutch drive command (DVLD)
M8
CL5
Main motor
M1
Waste toner receptacle
Developing assembly toner out signal (TSP)
Hopper toner out signal (TEP)
Waste toner feed motor driver PCB
Main motor driver PCB
DC controller PCB

Figure 3-44

2. Controlling the Toner Level

a. Monitoring the Toner Inside the Developing Assembly

The amount of toner inside the developing assembly is monitored by the toner level sensor circuit.

The developing assembly is equipped with two sensors; one for reference, and the other for toner level.

Since AC bias is applied to the developing cylinder and the blade, a magnetic field is created around them, and the reference sensor located opposite the blade mount generates a specific voltage at all times.

The magnetism from the magnetic field around the developing cylinder is transmitted through the toner to the toner level sensor, thereby changing the output of the toner level sensor according to the current amount of toner.

The level of the toner is monitored by comparing the outputs of these two sensors.

① When the Toner Inside the Developing Assembly is Excessive

The presence of toner around the toner level sensor causes the output of the sensor and the output voltage of the reference sensor to be identical.

The condition causes the output of the comparator circuit to go '0' and the toner out signal ($\overline{\text{TSP}}$) to go '1'.

② When the Toner Inside the Developing Assembly is Inadequate

The amount of toner round the toner level sensor decreases and, as a result, the output voltage of the sensor lowers. On the other hand, the output of the reference sensor remains the same and, therefore, the output voltage remains high.

The difference between the voltages causes the output of the comparator circuit to go '1' and the toner out signal ($\overline{\text{TSP}}$) to go '0'.

The condition causes the microprocessor to activate the hopper motor, which in turn causes hopper unit to supply toner to the developing assembly.

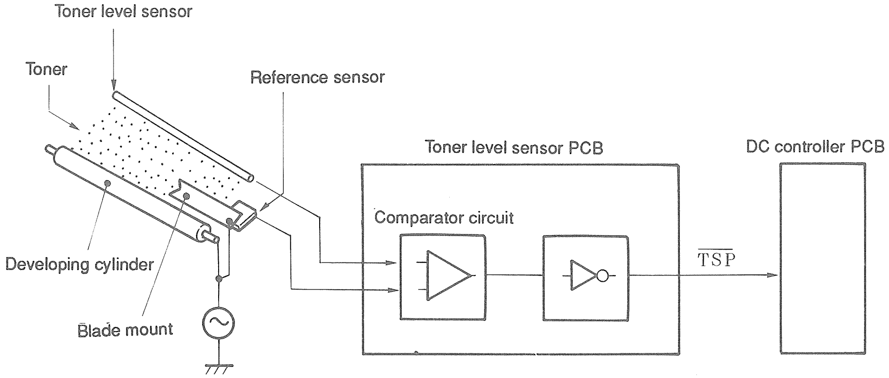


Figure 3-45

b. Monitoring the Toner Inside the Hopper unit

The detection unit of the toner sensor used inside the hopper unit is a piezoelectric oscillator which oscillates at several kHz in the absence of toner, causing the output of the sensor to go '0'. When toner is present, its weight stops the oscillation, causing the output of the sensor to go '1'.

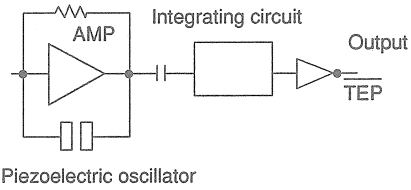
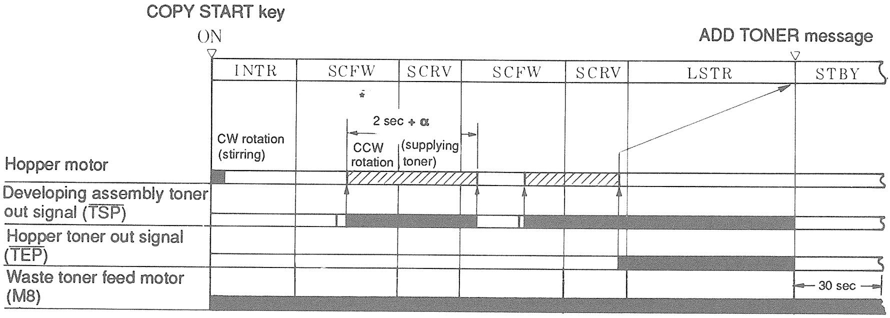

Integrating circuit
AMP
Output
$\overline{TEP}$
Piezoelectric oscillator

Figure 3-46

When the toner sensor inside the hopper unit identifies the absence of toner, the ADD TONER message will be displayed on the control panel upon completion of the ongoing copy run.


COPY START key
ON
ADD TONER message
INTR
SCFW
SCRV
SCFW
SCRV
LSTR
STBY
*
2 sec + α
CW rotation (stirring)
CCW rotation
(supplying toner)
Hopper motor
Developing assembly toner out signal ($\overline{TSP}$)
Hopper toner out signal ($\overline{TEP}$)
Waste toner feed motor (M8)
30 sec

*The hopper motor is forced to operate for two seconds.

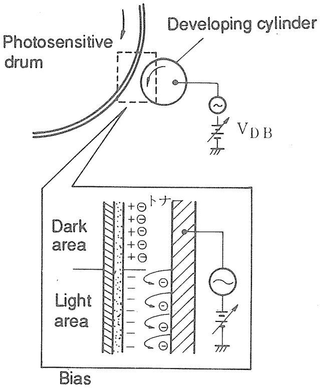
Figure 3-47

3. Controlling the Development Bias and Roller Electrode

a. Outline

An AC bias and DC bias are applied to the developing cylinder during copying operation. The DC bias is a voltage which is 80 V added to VL2 measured by the potential sensor before the copying operation.

When no copying operation is taking place, the DC bias is varied according to the surface potential of the drum so as to prevent adhesion of excessive toner to the photosensitive drum.



Bias
$V_{DB} = V_{L2} + 80$ 〔V〕

Figure 3-48

b. Timing of Control

Bias	Voltage	Period	Description
DC component	+200V	AINTR, INTR, LSTR	This is to prevent adhesion of excessive toner to the drum.
	+600V	CNTR1,2	The surface potential changes at all times; as such, the potential sensor take measurements and use them to prevent adhesion of excessive toner to the drum.
	+500V	INTR	This is to prevent adhesion of excessive toner to the drum.
	V_{L2}+80 V	SCFW, SCRV, and AER during copying operation	This is to prevent fogging in white backgrounds.
AC component	1400 Vp-p 2000 Hz		This is to execute projection development.

Table 3-11

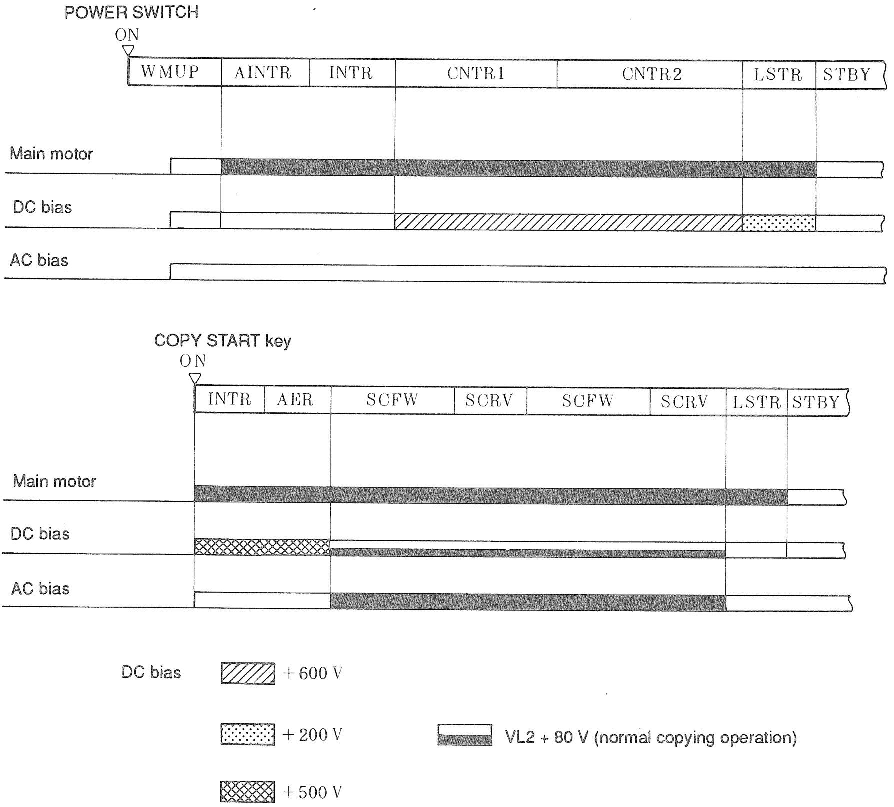

POWER SWITCH
ON
WMUP
AINTR
INTR
CNTR1
CNTR2
LSTR
STBY
Main motor
DC bias
AC bias
COPY START key
ON
INTR
AER
SCFW
SCRV
SCFW
SCRV
LSTR
STBY
Main motor
DC bias
AC bias
DC bias
+600 V
+200 V
+500 V
VL2 + 80 V (normal copying operation)

Figure 3-49

c. Development Bias Control Circuit
The circuit that controls the development bias has the following functions:

(1) Turns the AC bias ON and OFF.
(2) Turns the DC bias ON and OFF.

① Turning the AC Bias OFF
$\overline{\text{ACBTP}}$=1
↳ AC bias switch circuit goes ON.
  ↳ High-voltage AC transformer output cut off.

The condition deprives the developing cylinder of AC biases.

② Turning the AC Bias ON
- $\overline{\text{ACBTP}}$=0
  ↳ AC bias switching circuit goes OFF.

The condition causes the output of the square wave generator to be amplified by the current amplifier; thereafter, it is increased to 1400Vp-p by the high-voltage AC transformer and supplied to the developing cylinder.

③ Controlling the Voltage Level of the DC Bias
The voltage of the DC bias is determined by the signal (DCBC) sent from the potential control PCB.
When the output (DCBC) of the potential control circuit increases, the output of the differential amplifier circuit increases, thereby decreasing the voltage of the DC bias.

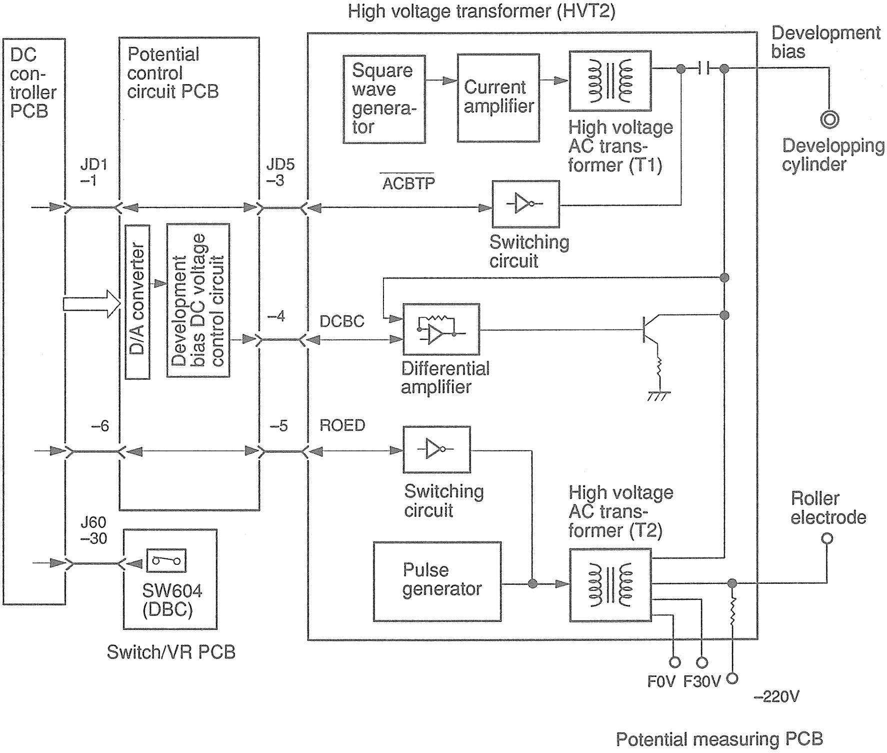

High voltage transformer (HVT2)
DC controller PCB
Potential control circuit PCB
Square wave generator
Current amplifier
High voltage AC transformer (T1)
Development bias
Developping cylinder
JD1 -1
JD5 -3
ACBTP
Switching circuit
D/A converter
Development bias DC voltage control circuit
-4
DCBC
Differential amplifier
-6
-5
ROED
Switching circuit
High voltage AC transformer (T2)
Roller electrode
J60 -30
SW604 (DBC)
Switch/VR PCB
Pulse generator
F0V
F30V
-220V
Potential measuring PCB

Figure 3-50

Note:

The mechanism that controls the development bias may be turned OFF by switching SW604 on the switch/VR PCB OFF.

d. Controlling the Roller Electrode Bias

The circuit that controls the roller electrode bias has the following functions:

(1) Turns the roller electrode ON and OFF.
(2) Supplies power to the surface potential measuring PCB.

① Turning the Roller Electrode Bias OFF

- ROED (roller electrode drive command) is '1' (i.e., registration roller OFF)
  ↳ Switching circuit goes ON.
    ↳ Pulse generator goes OFF.
      ↳ High-voltage DC transformer goes OFF.

The above condition deprives the roller elecrode of biases; further, the potential measuring circuit will also be deprived of power.

② Turning the Roller Electrode Bias ON

- ROED is '0' (i.e., registration roller ON)
  ↳ Switching circuit goes OFF.
    ↳ Pulse generator goes ON.
      ↳ High-voltage DC transformer goes ON.

The above condition supplies the roller electrode with a bias of about -1000 V. At the same time, the potential measuring PCB is supplied with power and goes ON.

4. Hopper Motor Drive Circuit

The hopper motor rotates in both clockwise and counterclockwise directions; when it rotates clockwise, the toner inside the hopper is stirred and supplied to the developing assembly and, when it rotates counterclockwise, the toner is stirred but not supplied to the developing assembly.

① Hopper Motor Goes OFF
$\overline{\mathrm{HMD}}=1$
└► Motor drive circuit goes OFF.
  └► Motor goes OFF.

② Hopper Goes ON
- $\overline{\mathrm{HMD}}=0$
  └► Motor drive circuit goes ON.

The above condition causes the motor to rotate clockwise or counterclockwise depending on the current combination of $\overline{\mathrm{HMDP1}}$ ($\overline{\mathrm{A}}$) and $\overline{\mathrm{HMDP2}}$ ($\overline{\mathrm{B}}$).

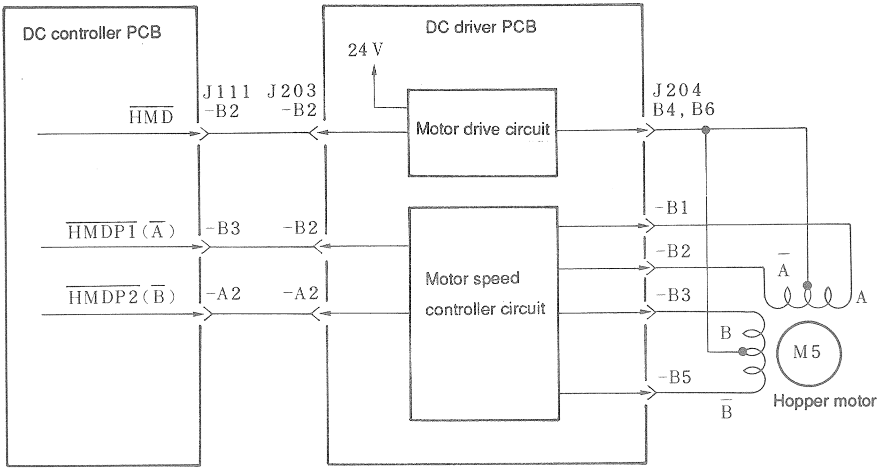

DC controller PCB
DC driver PCB
24 V
$\overline{\mathrm{HMD}}$
J111 -B2
J203 -B2
Motor drive circuit
J204 B4, B6
$\overline{\mathrm{HMDP1}}$ ($\overline{\mathrm{A}}$)
-B3
-B2
$\overline{\mathrm{HMDP2}}$ ($\overline{\mathrm{B}}$)
-A2
-A2
Motor speed controller circuit
-B1
-B2
-B3
-B5
$\overline{\mathrm{A}}$
A
B
$\overline{\mathrm{B}}$
M5
Hopper motor

Figure 3-51

G. DRUM HEATER CONTROL CIRCUIT

The inside of the photosensitive drum is equipped with a drum heater (80 W), and the heater is controlled so that the surface temperature of the drum is constant at all times.

As long as the power plug is connected to the outlet, the drum heater control PCB is supplied with AC power regardless of the position of the power switch. For this reason, the drum heater is controlled by turning it ON and OFF at all times.

The temperature of the drum is monitored by a thermistor built into the drum heater. If the temperature drops below the specified value for some reason, the output of the comparator goes '1', thereby causing the trigger circuit to go ON. This condition causes the triac to go ON and the drum heater will be activated.

If the temperature of the drum is higher than the specified value,the output of the comparator goes '0', causing the drum heater to go OFF.

The drum surface temperature is controlled to 42°C, and the thermal fuse is rated at 76°C.

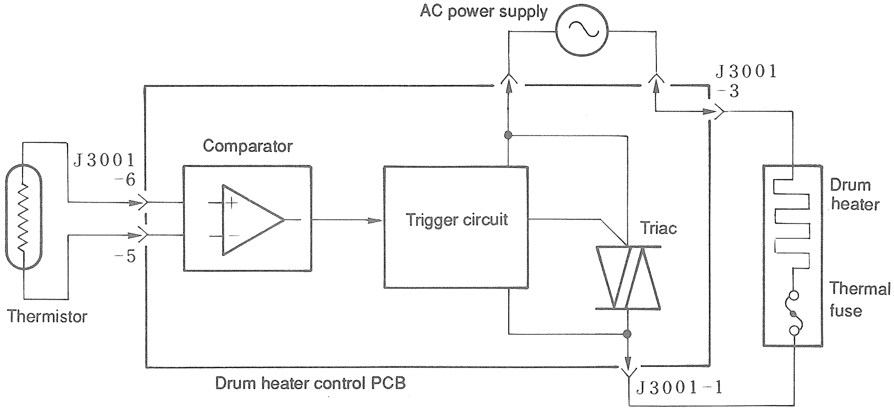

AC power supply
J3001 -3
Comparator
J3001 -6
-5
Thermistor
Trigger circuit
Triac
Drum heater
Thermal fuse
Drum heater control PCB
J3001-1

Figure 3-52

H. CLEANING THE CORONA WIRES

1. Outline

The copier is equipped with automatic cleaning mechanisms that clean the primary corona wire, pre-transfer corona wire, separation corona wire, and transfer corona wire. These mechanisms clean each of the corona wires under the following conditions.

① The temperature of the fixing assembly is 150°C or less when the power is switched ON.
② The command is executed in the user mode.
③ When the last rotation (LSTR) that occurs every 2000 copies is completed.
④ If cleaning has been executed under conditions 1 and 2 above, however, cleaning will take place every 2000 copies thereafter.

2. Mechanism

Each cleaning wire is cleaned by moving the corona cleaner back and forth.

The corona wire cleaner is driven by the cleaning motor and it moves back and forth along the corona wire for each cleaning session.

Note:

All corona wire motors are controlled by the primary corona wire cleaning motor drive command (PCLMD) and primary corona wire cleaner forward command (PCLMF).
When PCLMD=1 and PCLMF=1, the motor rotates clockwise; when PCLMD=1 and PCLMF=0, on the other hand, the motor rotates counterclockwise.

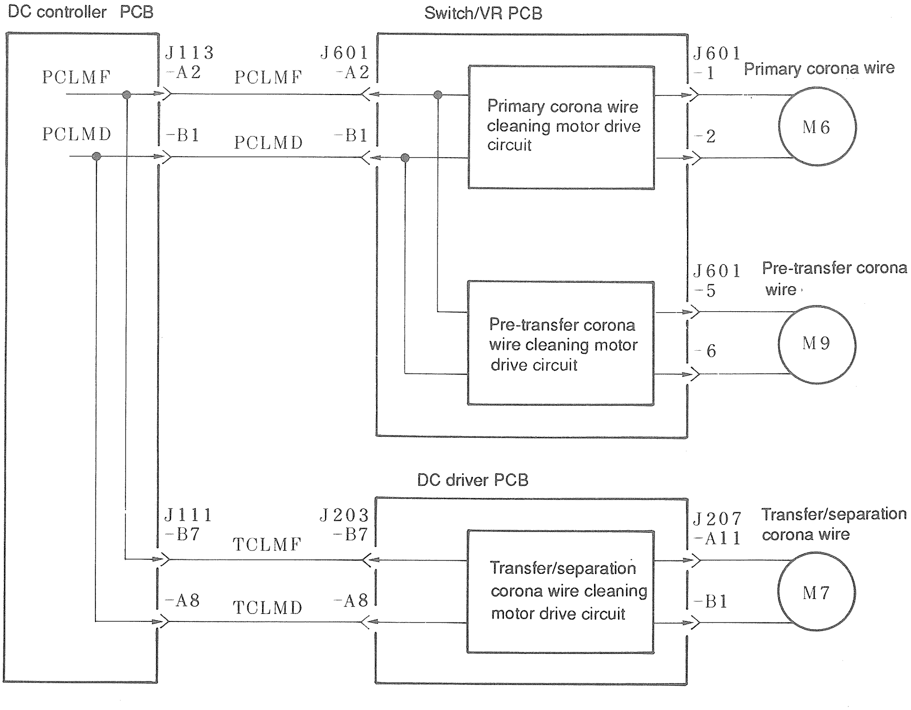

DC controller PCB
PCLMF
PCLMD
J113
-A2
-B1
PCLMF
PCLMD
J601
-A2
-B1
Switch/VR PCB
Primary corona wire cleaning motor drive circuit
Pre-transfer corona wire cleaning motor drive circuit
J601
-1
-2
Primary corona wire
M6
J601
-5
-6
Pre-transfer corona wire
M9
DC driver PCB
J111
-B7
-A8
TCLMF
TCLMD
J203
-B7
-A8
Transfer/separation corona wire cleaning motor drive circuit
J207
-A11
-B1
Transfer/separation corona wire
M7

Figure 3-53

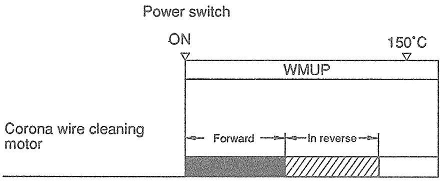


Figure 3-54

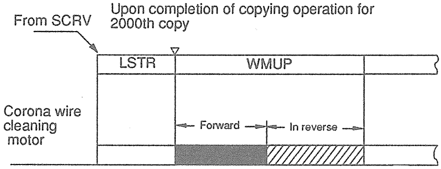


Figure 3-55

I. CONTROLLING THE WASTE TONER FEED MOTOR

Figure 3-56 shows the circuit that controls the waste toner feed motor and has the following functions:

① Turns the waste toner feed motor ON and OFF.

② Checks if the waste toner feed motor is locked or not.

If the waste toner inside the waste toner pipe cakes up and prevents rotation of the waste toner feed motor, 'E013' will be indicated on the control panel.

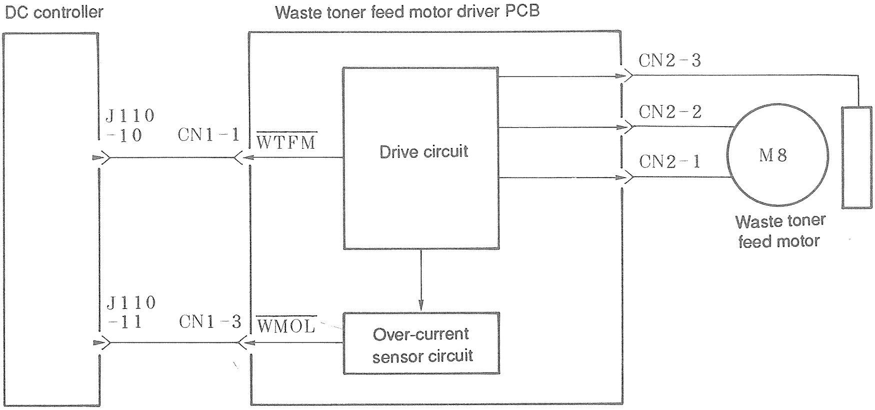

DC controller
Waste toner feed motor driver PCB
J110
-10
CN1-1
WTFM
Drive circuit
CN2-3
CN2-2
CN2-1
M8
Waste toner feed motor
J110
-11
CN1-3
WMOL
Over-current sensor circuit

Figure 3-56

IV. PICK-UP UNIT

A. OUTLINE

The presence/absence or the size of the cassette in the cassette holder is checked by the switches (SW49, SW50), four each, attached to the cassette holders.

The presence of paper inside the cassette is checked by the photointerrupters (Q12, Q13) attached to each of the cassette holders; paper fed from the manual feed tray is also checked by a photointerrupter (Q9).

When the pick-up roller clutch goes ON, the pick-up roller starts to rotate to forward a single sheet of copy paper from the cassette to the registration roller.

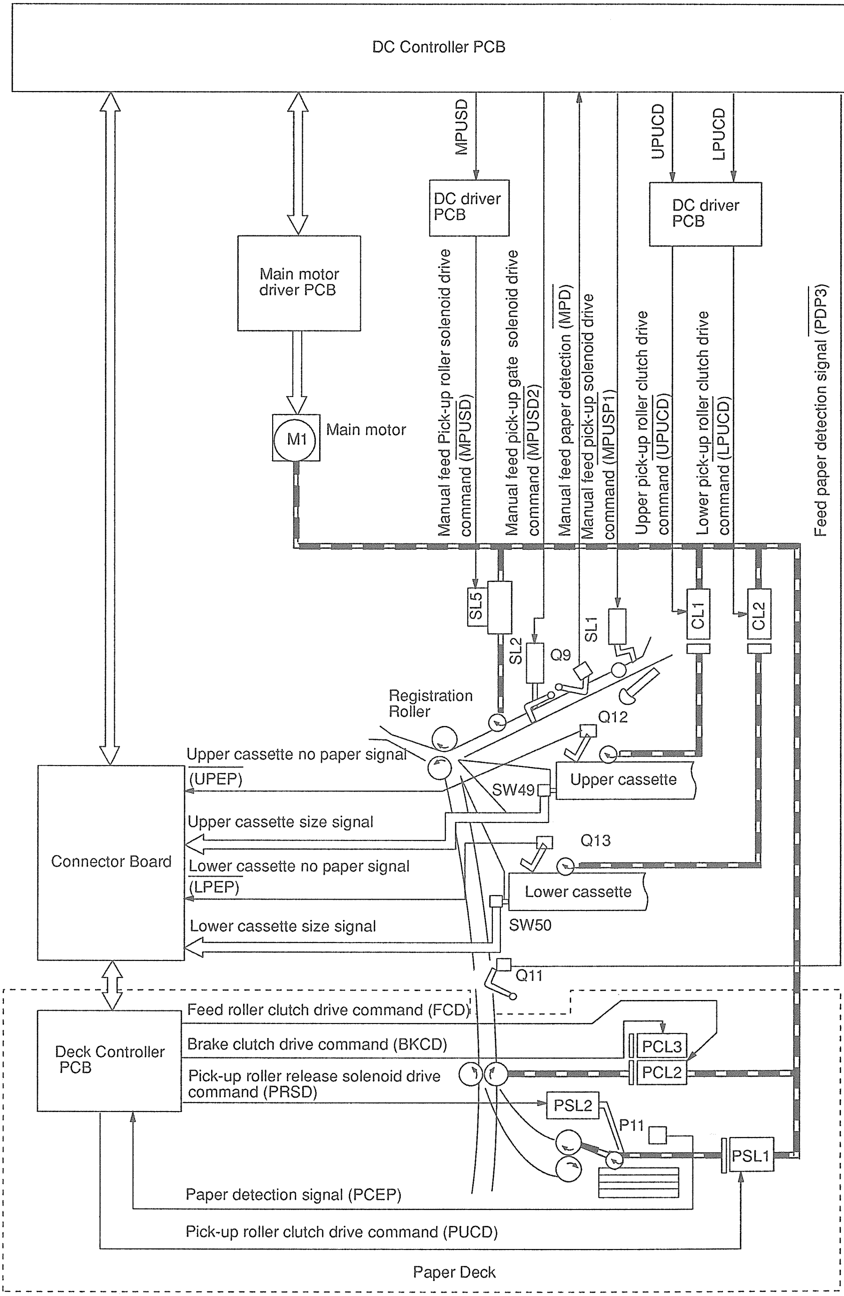
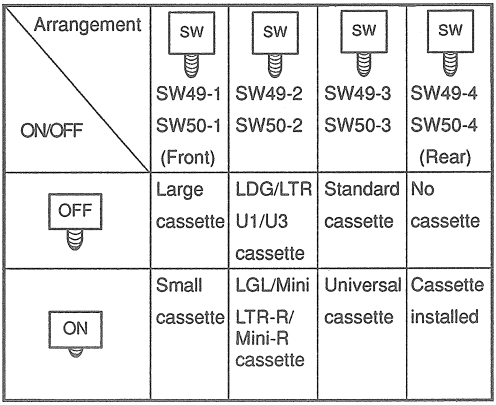

DC Controller PCB
MPUSD
UPUCD
LPUCD
DC driver PCB
DC driver PCB
Main motor driver PCB
M1
Main motor
Manual feed Pick-up roller solenoid drive command (MPUSD)
Manual feed pick-up gate solenoid drive command (MPUSD2)
Manual feed paper detection (MPD)
Manual feed pick-up solenoid drive command (MPUSP1)
Upper pick-up roller clutch drive command (UPUCD)
Lower pick-up roller clutch drive command (LPUCD)
Feed paper detection signal (PDP3)
SL5
SL2
Q9
SL1
CL1
CL2
Registration Roller
Q12
Upper cassette no paper signal (UPEP)
Upper cassette
SW49
Upper cassette size signal
Q13
Connector Board
Lower cassette no paper signal (LPEP)
Lower cassette
SW50
Lower cassette size signal
Q11
Feed roller clutch drive command (FCD)
Deck Controller PCB
Brake clutch drive command (BKCD)
PCL3
Pick-up roller release solenoid drive command (PRSD)
PCL2
PSL2
P11
PSL1
Paper detection signal (PCEP)
Pick-up roller clutch drive command (PUCD)
Paper Deck

Figure 3-57

B. CHECKING THE CASSETTE SIZE

When a cassette is set in the cassette holder, it actuates specific switches.

The combination of the actuated switches enables the microprocessor to identify the size of the cassette and, at the same time, decide the point of scanner reversal and control of blank exposure lamp; see Table 3-58.



Arrangement / ON/OFF	SW SW49-1 SW50-1 (Front)	SW SW49-2 SW50-2	SW SW49-3 SW50-3	SW SW49-4 SW50-4 (Rear)
OFF	Large cassette	LDG/LTR U1/U3 cassette	Standard cassette	No cassette
ON	Small cassette	LGL/Mini LTR-R/ Mini-R cassette	Universal cassette	Cassette installed

Figure 3-58

No.	Cassette	Switch			
		SW49-1 SW50-1	SW49-2 SW50-2	SW49-3 SW50-3	SW49-4 SW50-4
1	A3	OFF	OFF	OFF	ON
2	A4	ON	OFF	OFF	ON
3	B4	OFF	ON	OFF	ON
4	B5	ON	ON	OFF	ON
5	U1	OFF	OFF	ON	ON
6	U3	ON	OFF	ON	ON
7	Letter R	OFF	ON	ON	ON
8	Mini R	ON	ON	ON	ON

Table 3-12

C. PICK-UP FROM CASSETTE/ PAPER DECK

1. Outline

The pick-up clutch is an electromagnetic clutch. When the pick-up roller clutch goes ON, the pick-up roller starts to rotate to move copy paper into the copier and is made to form an arc (about 6 mm) at the registration roller and then stopped.

When the registration roller goes ON, the copy paper then is forwarded for transfer, separation, fixing, and delivery.

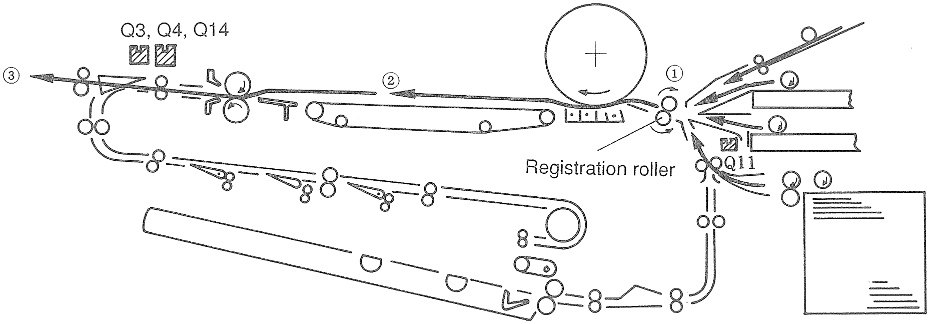
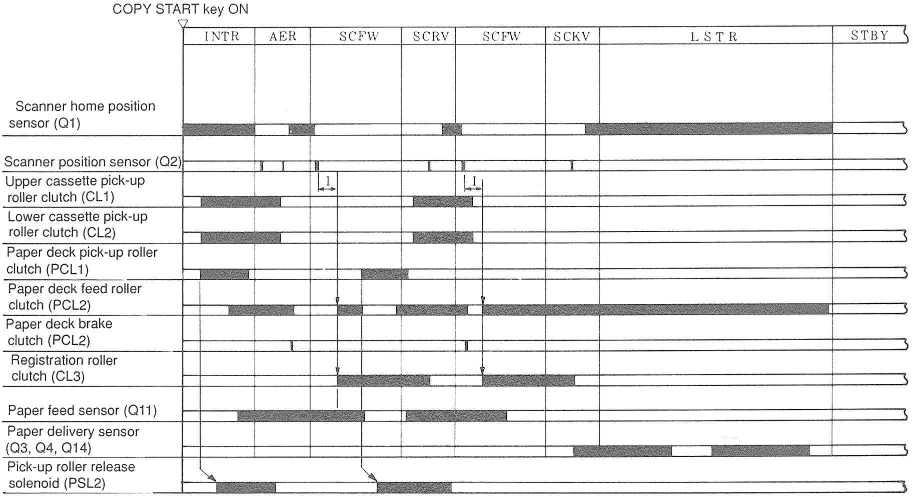


Figure 3-59



1: Varies depending on the binding margin.

Figure 3-60

2. Movement of Lifter (paper deck)

a. Ascent
When the paper door is closed, the lifter motor goes ON to move up the lifter.
When the lifter has moved up to lift the sensor arm, the lifter position sensor (PI2) generates signals to stop the lifter motor.
Copy paper is picked up sheet after sheet and, when the sensor arm leaves the lifter position sensor, the lifter motor goes ON to move up the lifter about 2 mm.

Note:

For the lifter to move up, the lifter driveenable signal ($\overline{\text{LIDE}}$) must be '0'.

b. Descent
When the paper door is opened, the lifter starts to lower.
If a jam occurs inside the copier, the lifter drive enable signal ($\overline{\text{LIDE}}$) goes '1' to move down the lifter. The lifter motor stops when the lifter has lowered and the cam pushes the lower limit switch (MS3).

c. Forced Suspension
If the lifter keeps moving up after it has moved up and blocked the lifter position sensor, the sensor arm pushes the microswitch (MS3) to stop the lifter.
If the lifter moves up in the absence of paper, the cam attached to the lifter pushes the microswitch (MS1) to stop the lifter motor.

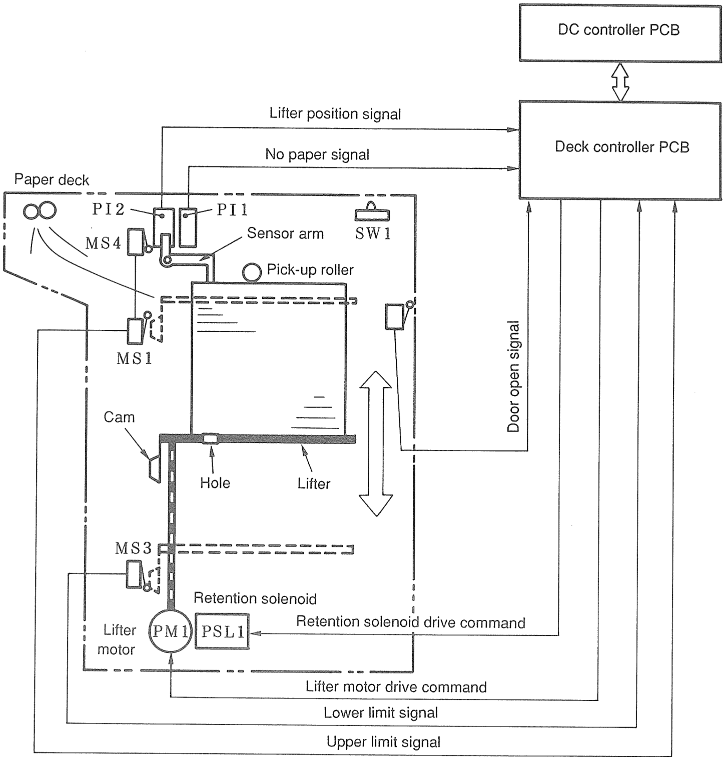

DC controller PCB
Deck controller PCB
Lifter position signal
No paper signal
Paper deck
PI 2
PI 1
MS 4
Sensor arm
SW 1
Pick-up roller
MS 1
Door open signal
Cam
Hole
Lifter
MS 3
Retention solenoid
Lifter motor
PM 1
PSL 1
Retention solenoid drive command
Lifter motor drive command
Lower limit signal
Upper limit signal

Figure 3-61

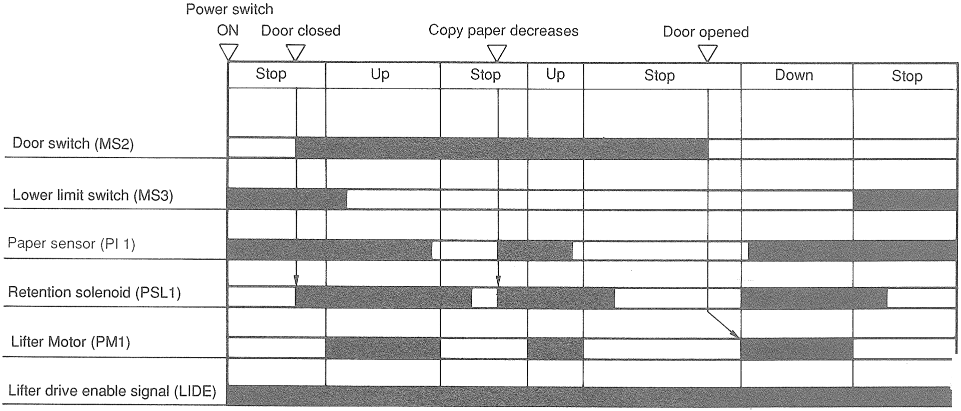


Figure 3-62

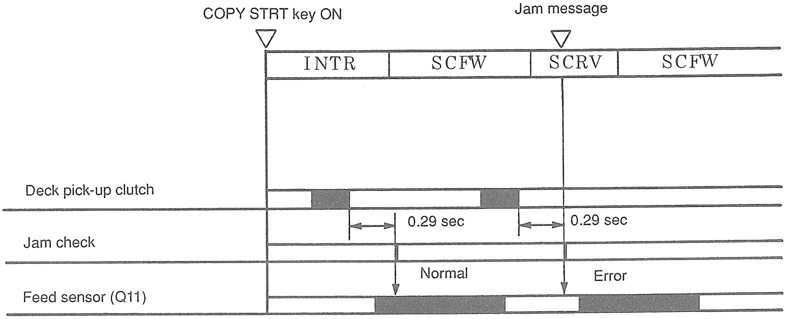
3. Checking Jams in the Paper Deck

If the pick-up is from the paper deck, the feed sensor (Q11) checks the movement of the copy paper; the sensor generates signals to help the microprocessor on the DC controller PCB to keep track of the movement of the jam.

When the microprocessor identifies a jam, the copying operation is stopped immediately.

The microprocessor identifies a jam in the following cases:

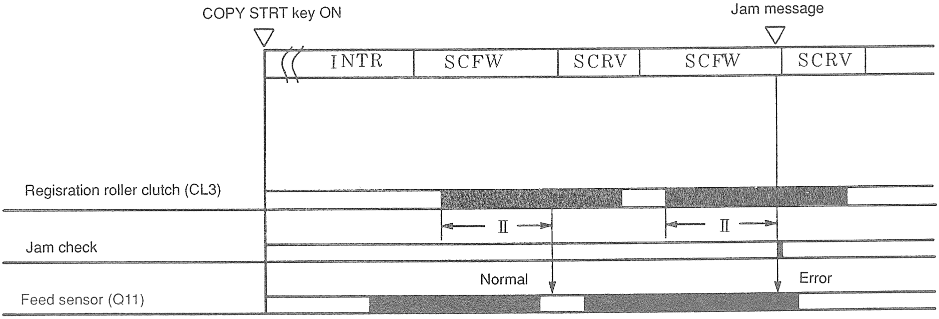
a. Delay Jam (pick-up from paper deck)



COPY STRT key ON
Jam message
INTR
SCFW
SCRV
SCFW
Deck pick-up clutch
0.29 sec
0.29 sec
Jam check
Normal
Error
Feed sensor (Q11)

Figure 3-63

b. Stationary Jam (pick-up from paper deck)



COPY STRT key ON
Jam message
INTR
SCFW
SCRV
SCFW
SCRV
Regisration roller clutch (CL3)
II
II
Jam check
Normal
Error
Feed sensor (Q11)

II: Varies depending on the length of paper.

Figure 3-64

D. PICK-UP FROM MANUAL FEED TRAY

When the manual feed tray is opened, the microswitch (MSJ) goes ON, activating the manual feed mode and, at the same time, causing the MANUAL indicator on the control panel to go ON.

When copy paper is slid along the guide on the manual feed tray, the photointerrupter (Q9) goes ON, causing the main motor to rotate at low speed. At the same time, the slope roller and pick-up roller start to rotate to move the paper into the copier.

Regardless of the size of the paper, the sequence used for A3 paper is used in the manual mode. Stationary jams in the delivery unit, however, are checked by Q9 based on the length of the paper.

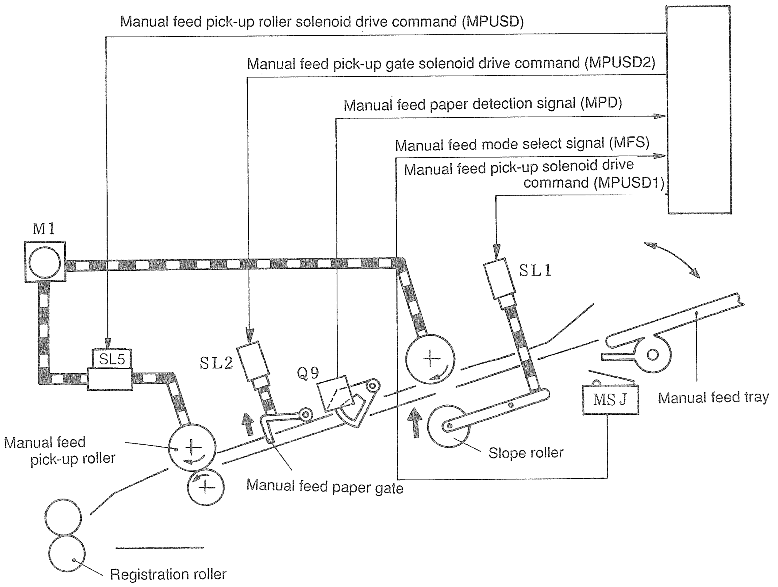

DC controller PCB
Manual feed pick-up roller solenoid drive command (MPUSD)
Manual feed pick-up gate solenoid drive command (MPUSD2)
Manual feed paper detection signal (MPD)
Manual feed mode select signal (MFS)
Manual feed pick-up solenoid drive command (MPUSD1)
M1
SL1
SL5
SL2
Q9
MS J
Manual feed tray
Manual feed pick-up roller
Slope roller
Manual feed paper gate
Registration roller

Figure 3-65

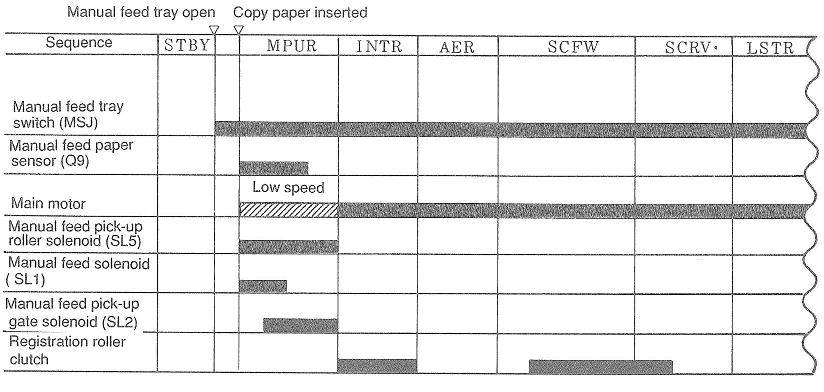


Figure 3-66

V. FEEDER AND DUPLEXING SYSTEMS

A. OUTLINE

When copy paper is picked up, it is controlled by the registration rollers so that it will be positioned at the point where it matches the image on the photosensitive drum; thereafter, it will be forwarded to the transfer assembly, separation assembly, feeder assembly, fixing assembly, and delivery assembly and then to the copy tray.

When making two-sided/overlay copies, the deflector 1 solenoid (DSL7) goes ON to forward the copy paper from the fixing assembly to the holding tray of the duplexing assembly.

The copy paper picked up from the holding tray is controlled by the feed roller and registration rollers so that it will be positioned at the point where it matches the image on the photosensitive drum. Thereafter, the copy paper is forwarded to the transfer assembly, separation assembly, feeder assembly, fixing assembly, and delivery assembly and then to the copy tray.

The delivery assembly has photointerrupters (Q3, Q4, Q14) that check if the copy paper has reached it or has passed it. If the paper fails to reach or pass the assembly within a specific period of time, the microprocessor identifies the condition as a jam and indicates the JAM message on the control panel.

A photointerrupter (Q10) is used to prevent damage to the rollers and separation claws that otherwise could occur when paper jams inside the fixing assembly.

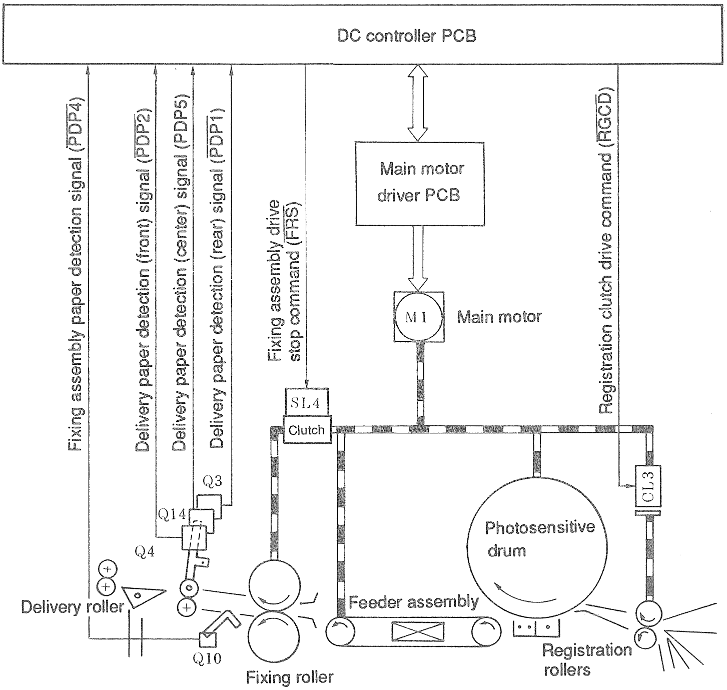

DC controller PCB
Fixing assembly paper detection signal ($\overline{PDP4}$)
Delivery paper detection (front) signal ($\overline{PDP2}$)
Delivery paper detection (center) signal (PDP5)
Delivery paper detection (rear) signal ($\overline{PDP1}$)
Fixing assembly drive stop command ($\overline{FRS}$)
Main motor driver PCB
M1
Main motor
Registration clutch drive command ($\overline{RGCD}$)
SL4
Clutch
Q3
Q14
Q4
CL3
Photosensitive drum
Delivery roller
Feeder assembly
Q10
Fixing roller
Registration rollers

Figure 3-67

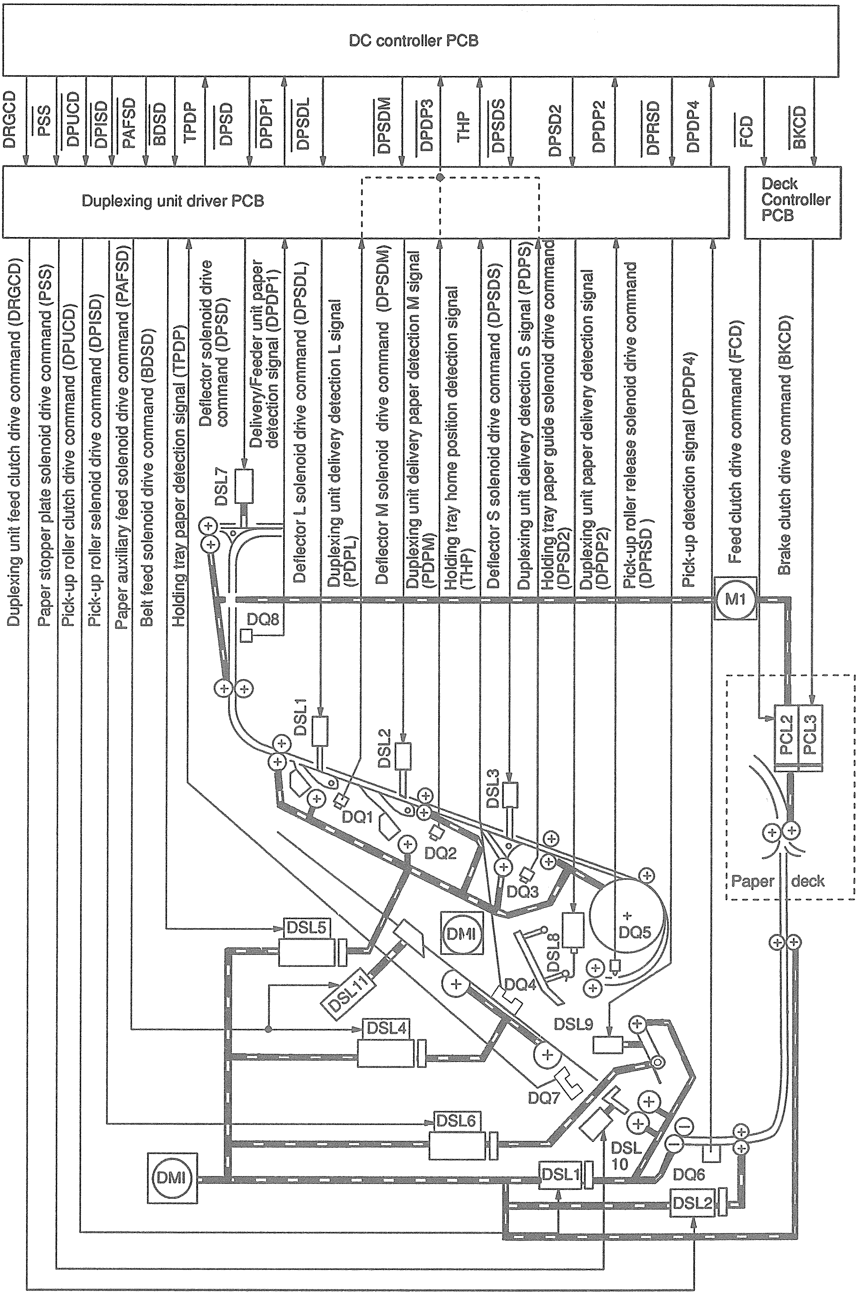
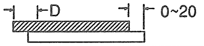
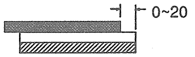
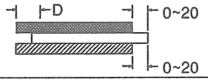
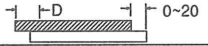
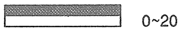
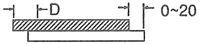
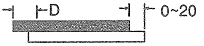
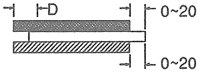
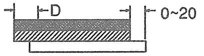
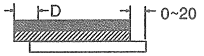
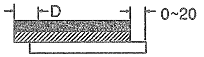

DC controller PCB
DRGCD
PSS
DPUCD
DPISD
PAFSD
BDSD
TPDP
DPSD
DPDP1
DPSDL
DPSDM
DPDP3
THP
DPSDS
DPSD2
DPDP2
DPRSD
DPDP4
FCD
BKCD
Duplexing unit driver PCB
Deck Controller PCB
Duplexing unit feed clutch drive command (DRGCD)
Paper stopper plate solenoid drive command (PSS)
Pick-up roller clutch drive command (DPUCD)
Pick-up roller selenoid drive command (DPISD)
Paper auxiliary feed solenoid drive command (PAFSD)
Belt feed solenoid drive command (BDSD)
Holding tray paper detection signal (TPDP)
Deflector solenoid drive command (DPSD)
Delivery/Feeder unit paper detection signal (DPDP1)
Deflector L solenoid drive command (DPSDL)
Duplexing unit delivery detection L signal (PDPL)
Deflector M solenoid drive command (DPSDM)
Duplexing unit delivery paper detection M signal (PDPM)
Holding tray home position detection signal (THP)
Deflector S solenoid drive command (DPSDS)
Duplexing unit delivery detection S signal (PDPS)
Holding tray paper guide solenoid drive command (DPSD2)
Duplexing unit paper delivery detection signal (DPDP2)
Pick-up roller release solenoid drive command (DPRSD)
Pick-up detection signal (DPDP4)
Feed clutch drive command (FCD)
Brake clutch drive command (BKCD)
M1
DSL7
DQ8
DSL1
DSL2
DQ1
DQ2
DSL3
DQ3
DQ5
DMI
DSL8
DSL5
DSL11
DQ4
DSL4
DSL9
DQ7
DSL6
DSL 10
DQ6
DMI
DSL1
DSL2
PCL2
PCL3
Paper deck

Figure 3-68

B. REGISTRATION CLUTCH

The registration clutch exerts control so that copy paper and the image on the drum match at a specific point.

1. Except in the binding margin mode, the registration clutch is controlled so that the leading edge of the copy paper and that of the image on the drum match.
2. In the binding margin mode, control as described in Figure 3-69 is executed to create a binding margin on the copy paper.

Mode selected		Copy paper	Shift (mm)	Copy paper on copy tray	Remarks
One-sided original to One-sided copy		B	0~20		
One-sided originals to Two-sided copy	1st side copy	A	0~20		The original is assumed to have a binding margin.
	2nd side copy	C	0		
Two-sided original to Two-sided copy	1st side copy	A	0~20		
	2nd side copy	B	0~20		
Two-sided original to (One-sided copies)	1st side copy	B	0~20		The original is assumed to have a binding margin.
	2nd side copy	C	0		
Two-page separation (one-sided copy)	1st side copy (left)	B	0~20		
	2nd side copy right)	B	0~20		
Two-page separation to Two-sided copy	1st side copy (left)	A	0~20		
	2nd side copy right)	B	0~20		
One-sided orignals to overlay copy	1st side copy	B	0~20		
	2nd side copy	B	0~20		
Two-sided orignal to Overlay-copy	1st side copy	B	0~20		
	2nd side copy	B	0~20		
Two-page separation to Overlay copy	1st side copy (left)	B	0~20		
	2nd side copy right)	B	0~20		

▭ Copy paper ▨ Image area on 1st side ■ Image area on 2st side D area: erased by blank exposure lamp.

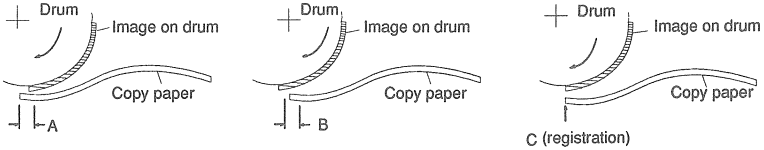

Drum
Image on drum
Copy paper
A
Drum
Image on drum
Copy paper
B
Drum
Image on drum
Copy paper
C (registration)

Figure 3-69

C. MAKING OVERLAY COPIES (1ST SIDE)

When copying on the first side, the deflector solenoids (DSL1, DSL2, DSL3, DSL7) as well as the paper guide plate solenoid (DSL8) and paper stopper solenoid (DSL10) go ON as soon as the registration clutch (CL3) goes ON to form the paper path for making overlay copies so that the paper is moved to the duplexing assembly after fixing.

When the first copy paper moves into the holding tray, the auxiliary feed solenoid (DSL4) goes ON to rotate the auxiliary roller, thereby butting the copy paper against the paper stopper; at the same time, the rib solenoid (DSL11) goes ON to lift the loading auxiliary rib.

When the last copy moves into the holding tray, the pick-up roller induction solenoid (DSL6) goes ON to lower the pick-up roller on the copy paper, thereby preventing displacement of the paper.

Deflector L: A3, B4, LDG, RGL
Deflector M: A4R, B5R, LTR-R
Deflector S: A4, B5, LTR

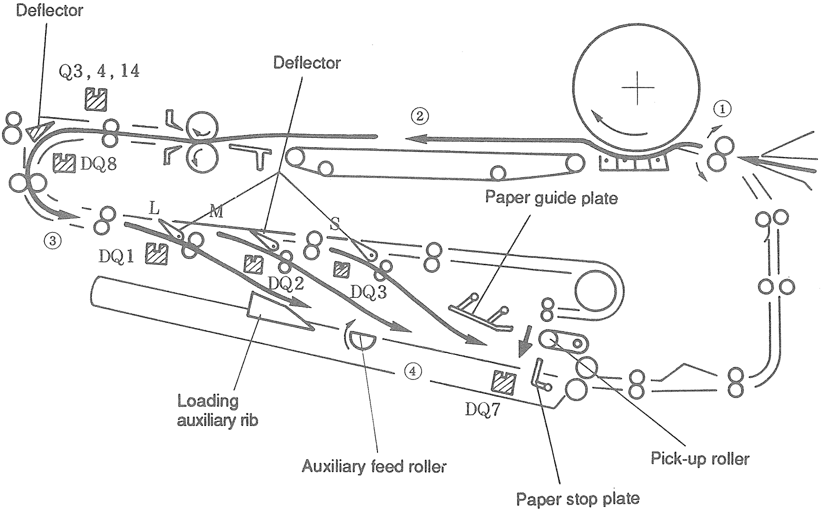

Deflector
Q3, 4, 14
Deflector
②
①
DQ8
L
M
S
③
DQ1
DQ2
DQ3
Paper guide plate
④
DQ7
Loading auxiliary rib
Auxiliary feed roller
Pick-up roller
Paper stop plate

Figure 3-70

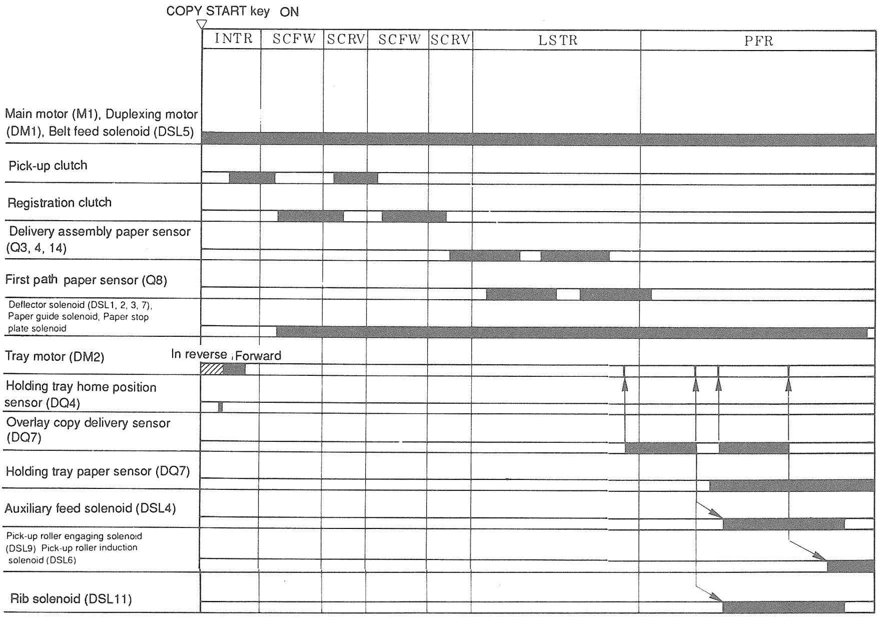

COPY START key ON
INTR
SCFW
SCRV
SCFW
SCRV
LSTR
PFR
Main motor (M1), Duplexing motor (DM1), Belt feed solenoid (DSL5)
Pick-up clutch
Registration clutch
Delivery assembly paper sensor (Q3, 4, 14)
First path paper sensor (Q8)
Deflector solenoid (DSL1, 2, 3, 7), Paper guide solenoid, Paper stop plate solenoid
Tray motor (DM2)
In reverse
Forward
Holding tray home position sensor (DQ4)
Overlay copy delivery sensor (DQ7)
Holding tray paper sensor (DQ7)
Auxiliary feed solenoid (DSL4)
Pick-up roller engaging solenoid (DSL9) Pick-up roller induction solenoid (DSL6)
Rib solenoid (DSL11)

Figure 3-71

D. MAKING TWO-SIDED COPIES (1ST SIDE)

When copying on the first side, the deflector solenoid (DSL7) and paper stop solenoid (DSL10) go ON as soon as the registration clutch (CL3) go ON to form the paper path for making two-sided copies so that the paper is moved to the duplexing assembly after fixing.

When the first copy moves into the holding tray, the paper auxiliary solenoid (DSL4) goes ON to rotate the paper auxiliary roller, thereby butting the copy paper against the paper stop plate; at the same time, the rib solenoid (DSL11) goes ON to lift the loading auxiliary rib.

When the last copy paper moves into the holding tray, the pick-up roller induction solenoid (DSL6) goes ON to lower the pick-up roller on the copy paper, thereby preventing displacement of the paper.

A margin is created along the trailing edge of the first side so as to prevent the copy paper from wrapping around the lower fixing roller when both sides have been copied.

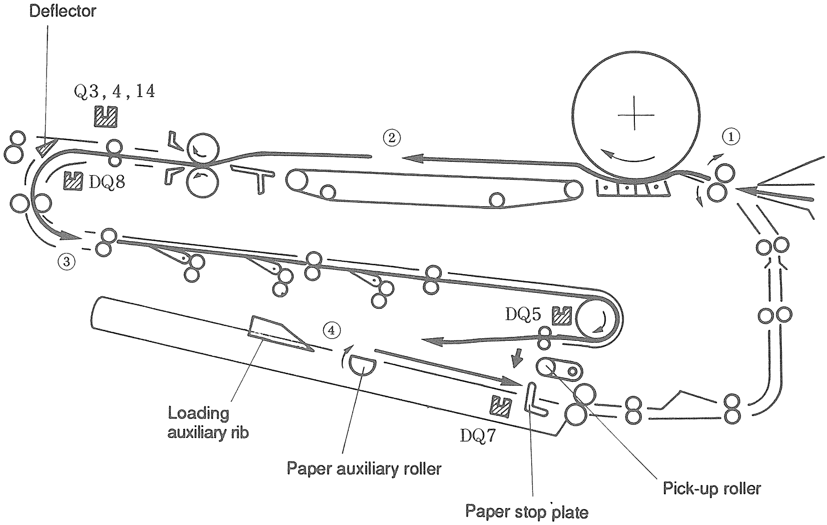


Figure 3-72

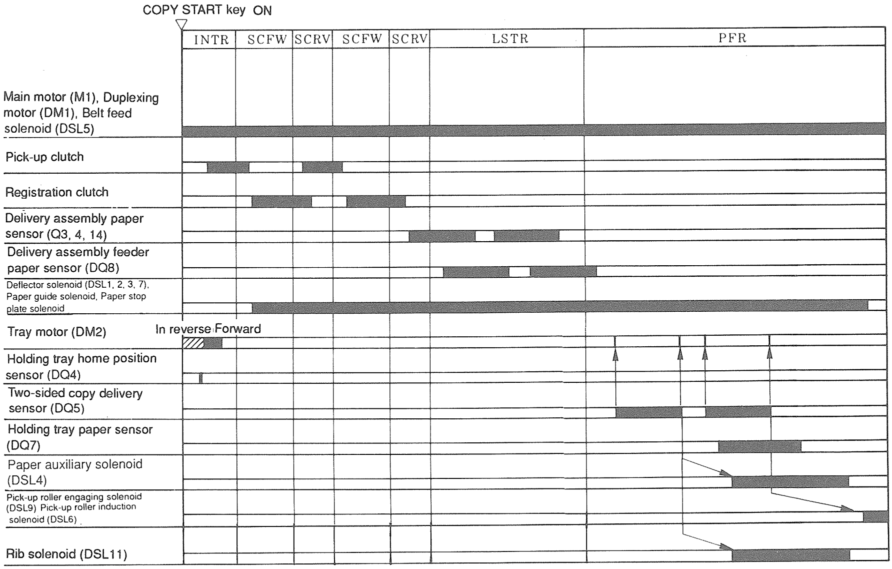

COPY START key ON
INTR
SCFW
SCRV
SCFW
SCRV
LSTR
PFR
Main motor (M1), Duplexing motor (DM1), Belt feed solenoid (DSL5)
Pick-up clutch
Registration clutch
Delivery assembly paper sensor (Q3, 4, 14)
Delivery assembly feeder paper sensor (DQ8)
Deflector solenoid (DSL1, 2, 3, 7), Paper guide solenoid, Paper stop plate solenoid
Tray motor (DM2)
In reverse
Forward
Holding tray home position sensor (DQ4)
Two-sided copy delivery sensor (DQ5)
Holding tray paper sensor (DQ7)
Paper auxiliary solenoid (DSL4)
Pick-up roller engaging solenoid (DSL9) Pick-up roller induction solenoid (DSL6)
Rib solenoid (DSL11)

Figure 3-73

E. MAKING TWO-SIDED/ OVERLAY COPIES (2ND SIDE)

1. Pick-Up

When the COPY START key is pressed, the pick-up clutch (DCL1) goes ON to pick up paper from the holding tray.

The copy paper is then moved forward for copying on its second side.

The paper deflector (deflector 1) is at its normal position and, therefore, the copy paper after fixing is delivered to the copy tray.

The pick-up roller, when a pick-up starts and DQ6 goes ON, is lifted by the pick-up roller engaging solenoid (DSL9) by about 10 mm and leaves the copy paper; it thereafter lowers once again to pick up the next copy paper.

When the last copy paper is picked up, the pick-up roller induction solenoid (DSL6) goes OFF to lift the pick-up roller to the home position for the next copying operation.

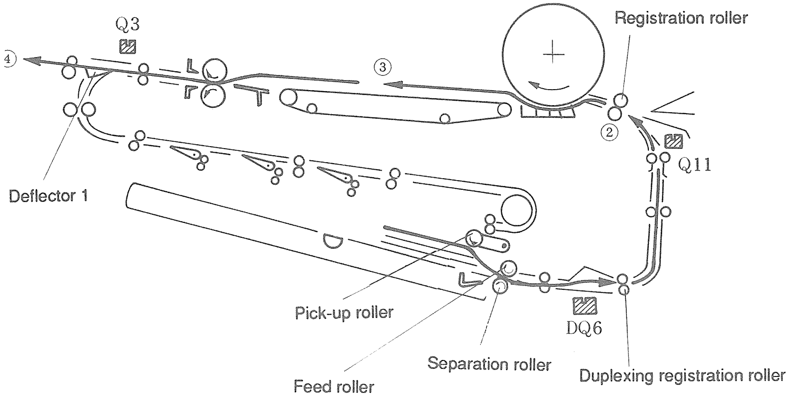

Q3
④
③
Registration roller
②
Q11
Deflector 1
Pick-up roller
DQ6
Separation roller
Feed roller
Duplexing registration roller

Figure 3-74

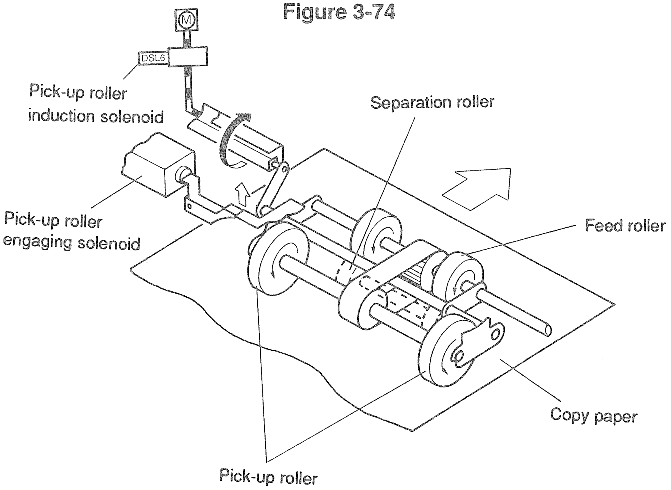

M
DSL6
Pick-up roller induction solenoid
Separation roller
Pick-up roller engaging solenoid
Feed roller
Copy paper
Pick-up roller

Figure 3-75

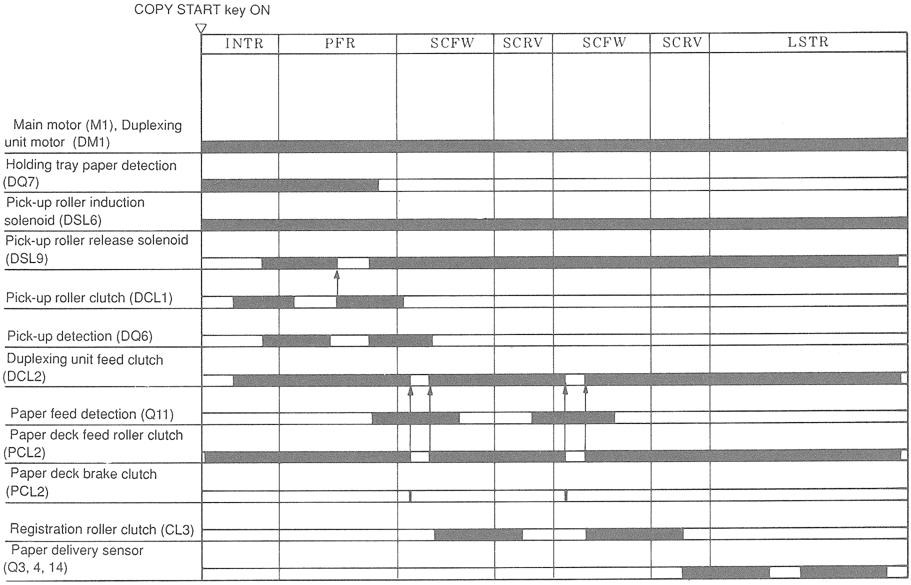

COPY START key ON
INTR
PFR
SCFW
SCRV
SCFW
SCRV
LSTR
Main motor (M1), Duplexing unit motor (DM1)
Holding tray paper detection (DQ7)
Pick-up roller induction solenoid (DSL6)
Pick-up roller release solenoid (DSL9)
Pick-up roller clutch (DCL1)
Pick-up detection (DQ6)
Duplexing unit feed clutch (DCL2)
Paper feed detection (Q11)
Paper deck feed roller clutch (PCL2)
Paper deck brake clutch (PCL2)
Registration roller clutch (CL3)
Paper delivery sensor (Q3, 4, 14)

Figure 3-76

2. Summary of Pick-Up Roller Operations

(1) When the first copy paper moves in, the loading auxiliary rib moves up and, at the same time, the paper auxiliary roller rotates to butt the paper against the paper stop plate.

(2) When the last copy paper moves in, the pick-up roller lowers to the pick-up position; at same time, the paper stop plate lowers to the holding tray.

(3) When the COPY START key is pressed for the second side, the pick-up roller rotates to pick up the copy paper.

(4) When the copy paper is picked up, the pick-up roller rises 10 mm (disengaged); it then waits for copy paper.

(5) When the first copy paper is moved, the pick-up roller lowers to pick up the second copy paper.

(6) When all copy paper has been picked up, the pick-up roller is raised to the home position in preparation for the next copying operation.

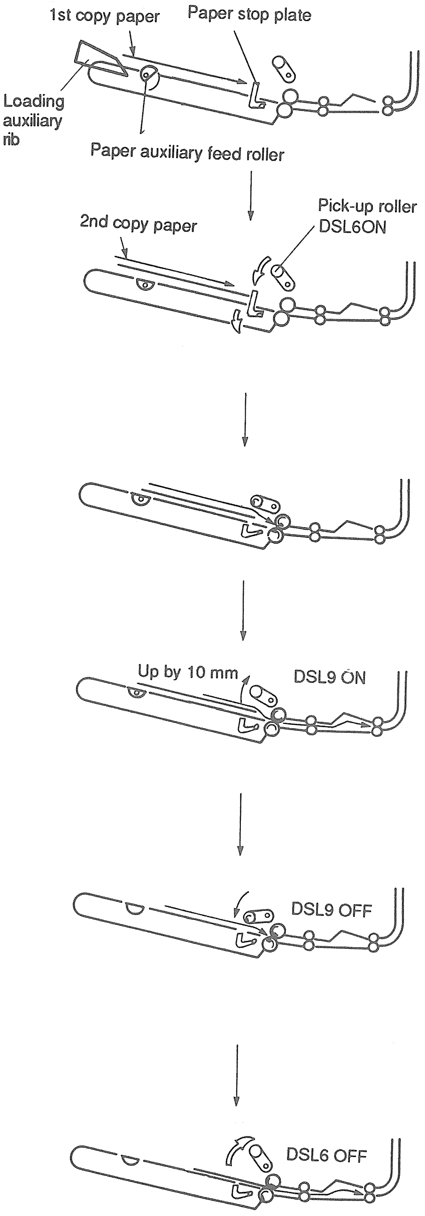

1st copy paper
Paper stop plate
Loading auxiliary rib
Paper auxiliary feed roller
2nd copy paper
Pick-up roller
DSL6ON
Up by 10 mm
DSL9 ON
DSL9 OFF
DSL6 OFF

Figure 3-77

F. DUPLEXING MOTOR CONTROL CIRCUIT

1. Outline

Figure 3-78 shows the circuit that controls the duplexing motor with the following functions:

① Turns the duplexing motor ON and OFF.
② Switches the speed of the duplexing motor.
③ Controls the speed of the duplexing motor.
④ Checks the duplexing motor for a fault.

The duplexing motor is controlled by the signal (BSMD) from the DC controller PCB.

The speed of the duplexing motor is switched by the main motor speed control signal (MMSC0, MMSC1) generated by the copier's DC controller PCB.

The duplexing motor is a DC motor equipped with a built-in clock pulse generator. When the motor rotates, clock pulses of a frequency that corresponds to the revolution of the motor are generated; the speed of the motor is controlled using these clock pulses.

2. Mechanism

a. Turning the Motor ON and OFF
When BSMD is '0', the speed control circuit does not issue the control signal; therefore, the duplexing motor will not rotate regardless of the state of the speed switching signal.
When BSMD is '1', the speed control circuit issues the control signal to cause the drive circuit to go ON, thereby rotating the duplexing motor.

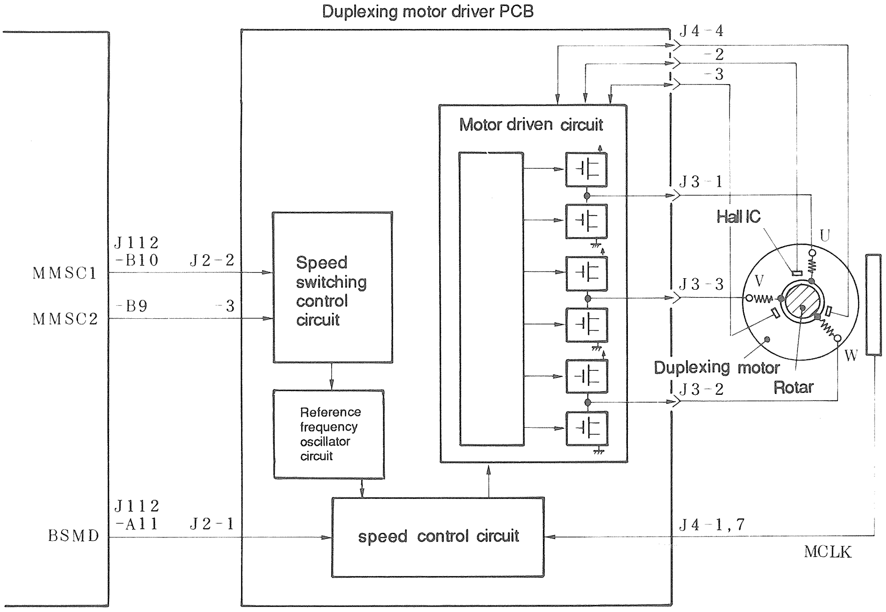

Duplexing motor driver PCB
J4-4
-2
-3
Motor driven circuit
J3-1
Hall IC
U
V
J3-3
W
Duplexing motor
Rotar
J3-2
J112
-B10
J2-2
MMSC1
-B9
-3
MMSC2
Speed switching control circuit
Reference frequency oscillator circuit
J112
-A11
J2-1
BSMD
speed control circuit
J4-1,7
MCLK

Figure 3-78

b. Switching the Speed
Table 3-13 shows the relationship between the speed of the motor and MMSC0, MMSC1, and BSMD.

MMSC0	MMSC1	BSMD	Duplexing motor
1	1	1	High-speed
1	0	1	Medium speed
0	1	0	At rest

Table 3-13

When MMSC0 and MMSC1 are both '1', the reference frequency oscillator sends a reference frequency signal for high speed to the speed control circuit.
When MMSC0 is '1' and MMSC1 is '0', the speed control circuit receives a reference frequency which is 70% of that issued for high speed; the duplexing motor, as such, rotates at a speed 70% that of high speed rotation.
When BSMD is '0', the duplexing motor remains at rest.

c. Speed of Rotation
When the duplexing motor rotates, the duplexing motor issues clock pulses (MCLK) of a frequency that corresponds to the revolution of the motor.
The speed control circuit in turn generates control signals so that the clock pules (MCLK) and the reference signals from the reference frequency oscillator match at all times.
The motor drive circuit does not vary the voltage applied to the motor, i.e., the voltage remains constant; it turns the power to the motor ON and OFF at specific intervals to control the speed of the motor.

d. Fault Detection
The power supply line of the motor driver PCB is equipped with a fuse that is designed to blow off in response to an overcurrent, thereby depriving the duplexing motor of power.

G. HOLDING TRAY MOTOR

1. Outline

The paper size guide plate of the holding tray is driven by the holding tray motor located under the tray. The holding tray motor is a stepping motor, and the direction and angle of rotation are controlled by the pules signals (TMDP1, TMDP2) generated by the copier's DC controller.

When the two-sided mode is selected and the COPY START key is pressed, the holding tray motor starts to rotate and the holding tray guide plate is moved to a point at which the signal generating plate shown in Figure 3-79 blocks the home position sensor (counterclockwise rotation).

When the signal generating plate reaches the home position sensor, the holding tray motor switches to clockwise rotation, thereby moving the holding tray guide plate to a specific point determined by the size of the copy paper.

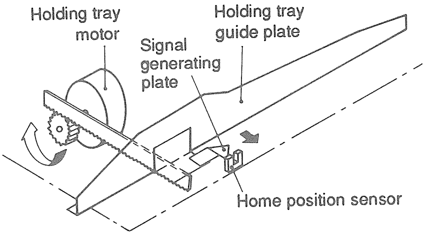


Figure 3-79

2. Holding Tray Motor Drive Circuit

When the holding tray motor rotates, the motor is driven by 24 V to move the holding tray. When the holding tray motor is at rest, on the other hand, the motor is supplied with 5 V at all times to prevent displacement of the holding tray guide plate.

a. Holding Tray Motor is OFF
- $\overline{\text{TMH}}=0$
  - ↳ Motor drive voltage switching circuit switches to 5V side.
    - ↳ Motor is supplied with 5 V.
      - ↳ Motor stops.

b. Holding Tray Motor is ON
- $\overline{\text{TMH}}=1$
  - ↳ Motor drive voltage switching circuit switches to 24V side.
    - ↳ Motor is supplied with 24 V.

In this condition, the motor rotates clockwise or counterclockwise depending on the combination of TMDP1 (A) and TMDP2 (B).

3. After Removal of Jams

The holding tray guide plate is first moved to its home position and then moved to a specific point after removal of jams; otherwise, the plate could be displaced by the user removing a jam from the duplexing unit.

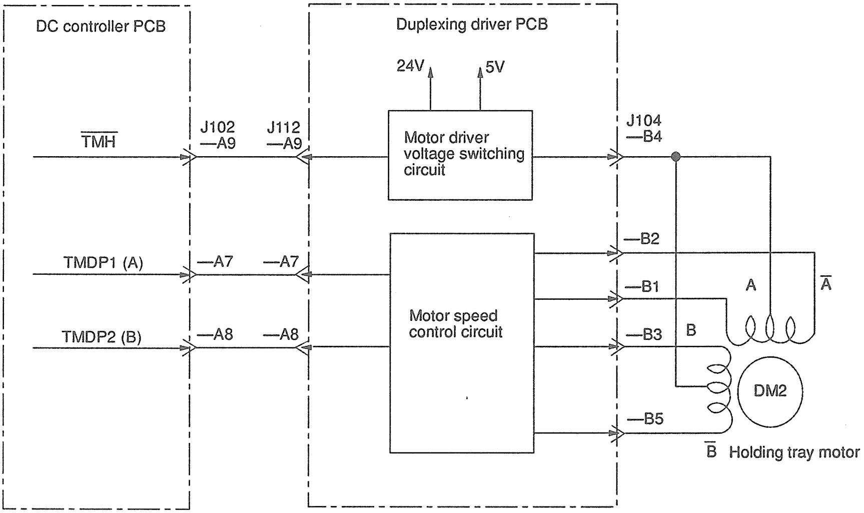

DC controller PCB
Duplexing driver PCB
24V
5V
TMH
J102
—A9
J112
—A9
Motor driver voltage switching circuit
J104
—B4
TMDP1 (A)
—A7
—A7
—B2
—B1
A
A
Motor speed control circuit
TMDP2 (B)
—A8
—A8
—B3
B
DM2
—B5
B
Holding tray motor

Figure 3-80

H. FIXING ASSEMBLY AND DELIVERY ASSEMBLY

1. Outline

The upper roller and lower roller of the fixing assembly and the delivery roller of the delivery assembly are driven by the main motor by way of a clutch.

If a jam occurs in the fixing assembly or delivery assembly, the fixing assembly drive solenoid (SL4) goes ON to stop the fixing roller immediately.

The upper roller has two heaters. The temperature of the fixing upper roller is checked by a thermistor (TH1), and the DC controller controls the temperature of the fixing upper roller to a specific value.

The cleaning belt that cleans the upper roller is taken up by the cleaning motor (M4). The end of the belt is given a cut-out; the cut-out is checked by the detection lever and two photointerrupters (Q5, Q6) and, when the belt runs out, a warning will be indicated on the control panel.

Note:

i. The same control temperatures apply even when the copier is in the pre-heat mode.
ii. The upper roller consists of the main heater (H3; 1250 W) and sub heater (H2; 350 W).

Condition	Standby	Copying	
		A3, B4, A4, LDG, LTR	A4R, B5R LGL, LTR-R, Mini
Ambient temperature* at 18°C or less and within 20min of power-on	Controlled at 195°C	Controlled at 195°C	Controlled at 180°C
Other than above	Controlled at 180°C	Controlled at 185°C	Controlled at 175°C

* Readings from the thermistor (TH601) attached to the switch/VR PCB.

Table 3-14

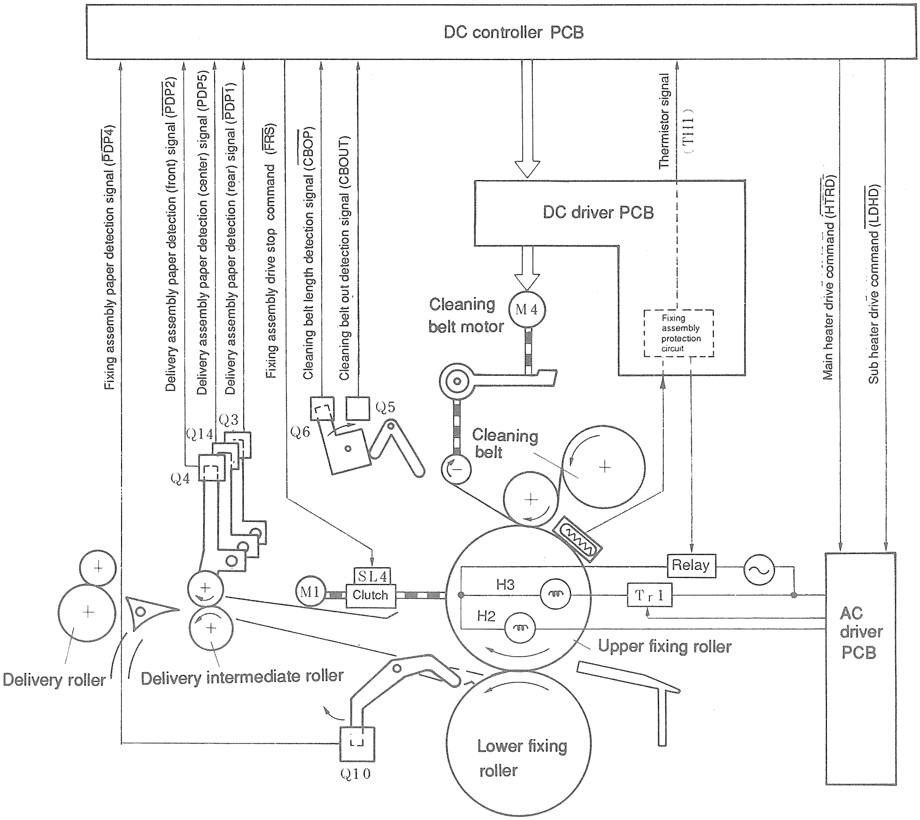

DC controller PCB
Fixing assembly paper detection signal (PDP4)
Delivery assembly paper detection (front) signal (PDP2)
Delivery assembly paper detection (center) signal (PDP5)
Delivery assembly paper detection (rear) signal (PDP1)
Fixing assembly drive stop command (FRS)
Cleaning belt length detection signal (CBOP)
Cleaning belt out detection signal (CBOUT)
Thermistor signal
(TH1)
Main heater drive command (HTRD)
Sub heater drive command (LDHD)
DC driver PCB
Cleaning belt motor
M4
Fixing assembly protection circuit
Q14
Q3
Q4
Q6
Q5
Cleaning belt
Relay
H3
H2
Tr1
SL4
Clutch
M1
AC driver PCB
Upper fixing roller
Delivery roller
Delivery intermediate roller
Lower fixing roller
Q10

Figure 3-81

2. Controlling the Copying Speed

If continuous copying was executed immediately after the copier is switched ON, the surface temperature of the upper fixing roller (fixing temperature) gradually lowers and, ultimately, would result in fixing failure. To prevent this, the copying speed is lowered to 70% of the normal speed.

Ambient temperature*	23°C or more	Less than 23°C
Fixing temperature	158°C or less	164°C or less

Table 3-15

*Temperature measured by the thermistor mounted on the switch/VR PCB.

Note:

The copying operation will be stopped under the following conditions, and the COPY START key will not respond until the temperature reaches a specific value; thereafter, a press on it produces the copies that had been left out before the tempera-ture dropped below the specified value.

① At an ambient temperature of less than 28°C, the fixing temperature is 155°C or less.
② At an ambient temperature of 28°C or more, the fixing temperature is 152°C or more.

3. Reciprocating Mechanism for Thermistor

To prevent the thermistor from scratching the upper fixing roller, the thermistor is moved across the upper fixing roller over a distance of 10 mm; this is called a reciprocating mechanism.

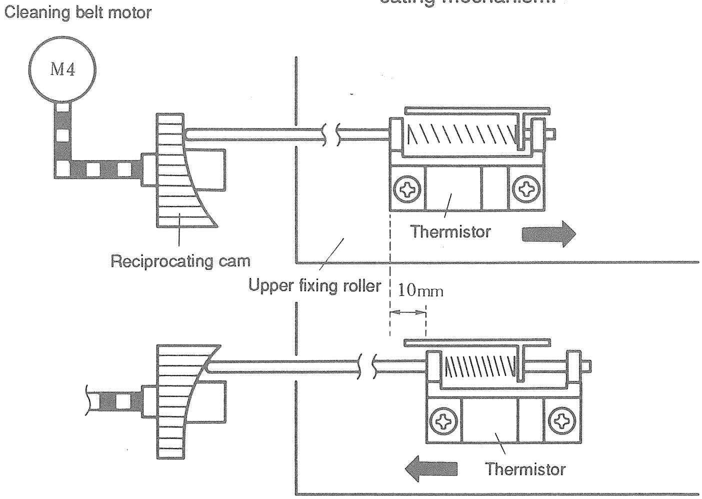


Figure 3-82

4. Reciprocating Mechanism for Upper Separation Claw

To prevent the upper separation claw from scratching the upper fixing roller, the upper separation claw is moved across the upper fixing roller over a distance of 6 mm.

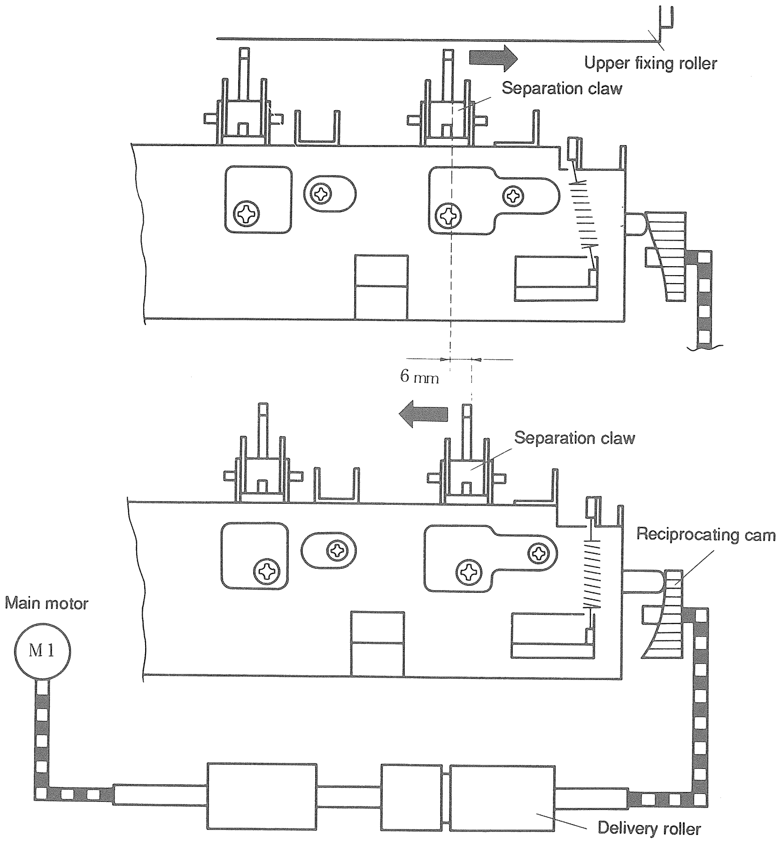

Upper fixing roller
Separation claw
6 mm
Separation claw
Reciprocating cam
Main motor
M1
Delivery roller

Figure 3-82

5. Sequence for Fixing

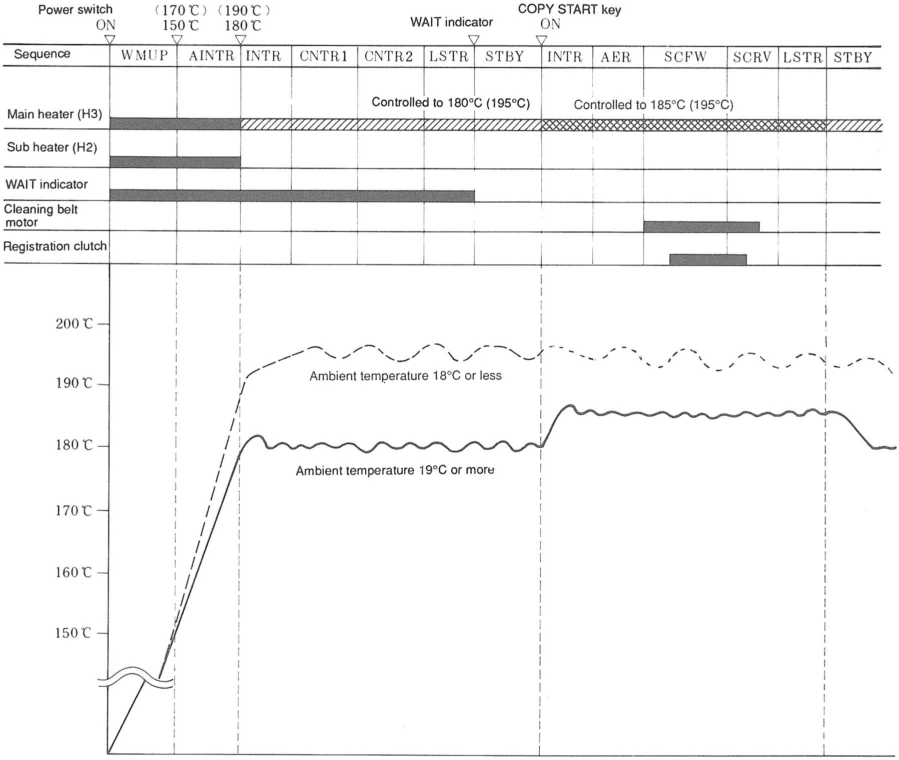


Figure 3-84

6. Fixing Assembly Protection Circuit

If the surface temperature of the upper fixing roller exceeds 230°C, E001 will be indicated and the fixing heater goes OFF. If the surface temperature exceeds 250°C for some reason, the protection circuit shown in Figure 3-85 will activate a relay, thereby depriving the fixing assembly of power.

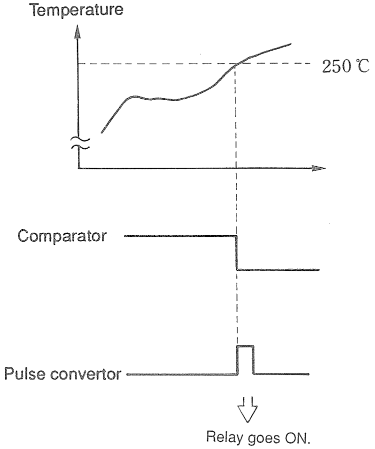


Figure 3-85a

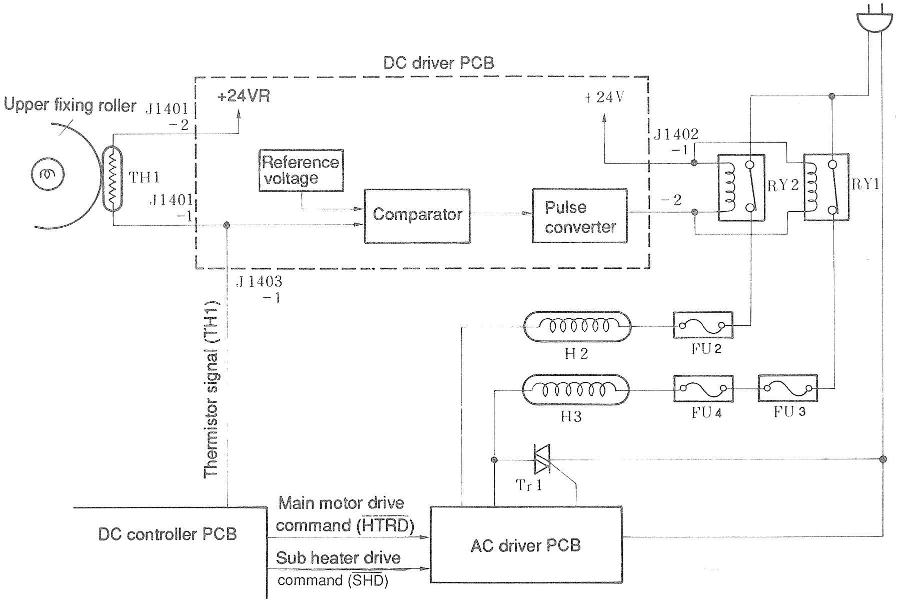

DC driver PCB
Upper fixing roller
J1401 -2
+24VR
+24V
TH1
J1401 -1
Reference voltage
Comparator
Pulse converter
J1402 -1
-2
RY2
RY1
J 1403 -1
Thermistor signal (TH1)
H 2
FU 2
H3
FU 4
FU 3
Tr 1
DC controller PCB
Main motor drive command (HTRD)
Sub heater drive command (SHD)
AC driver PCB

Figure 3-85

7. Cleaning Belt Motor Drive Circuit

The cleaning belt motor rotates in one direction only; when at rest, the motor is not supplied with power.

a. Cleaning Motor is OFF
- $\overline{\text{WMD}}=1$
  - ↳ Motor drive circuit goes OFF.
    - ↳ Motor goes OFF.

b. Cleaning Motor is ON
- $\overline{\text{WMD}}=0$
  - ↳ Motor goes ON.

  At the time, the motor rotates in relation to pules $\overline{\text{WMDP1}}$ (A) and $\overline{\text{WMDP2}}$ (B).

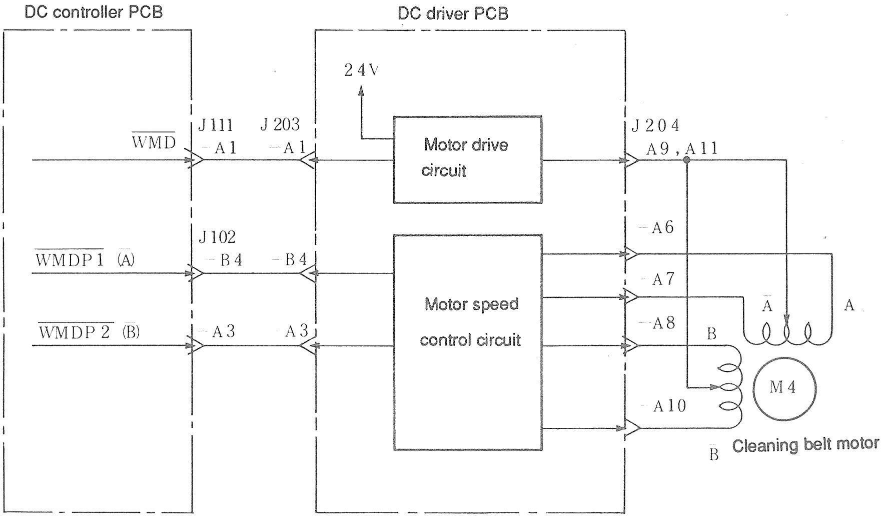

DC controller PCB
DC driver PCB
24V
$\overline{\text{WMD}}$
J111
A1
J203
A1
Motor drive circuit
J204
A9, A11
J102
$\overline{\text{WMDP1}}$ (A)
B4
B4
$\overline{\text{WMDP2}}$ (B)
A3
A3
Motor speed control circuit
A6
A7
A8
A10
$\overline{\text{A}}$
A
B
$\overline{\text{B}}$
M4
Cleaning belt motor

Figure 3-86

8. Monitoring the Cleaning Belt

The cleaning belt has two notches which are mechanically checked by the cleaning belt detection lever.

When the cleaning belt detection lever comes across finds the notch, a warning will be indicated on the control panel.

To check the warning message for the cleaning belt, press SW605 on the SW/VR PCB (service mode); it will be indicated on the message display. The message will not be indicated in normal modes.

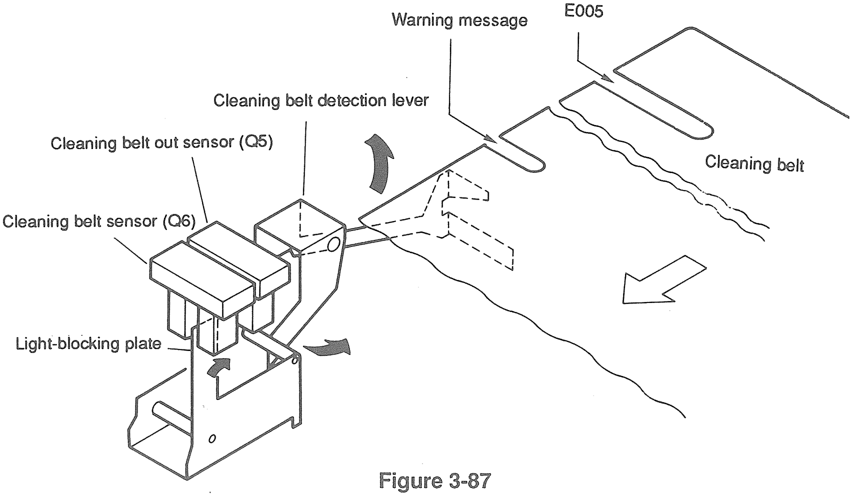

Warning message
E005
Cleaning belt detection lever
Cleaning belt out sensor (Q5)
Cleaning belt sensor (Q6)
Light-blocking plate
Cleaning belt

Figure 3-87

Figure 3-88 shows the spatial orientation of the light-blocking plate when the short notch and the long notch of the cleaning belt has been detected.

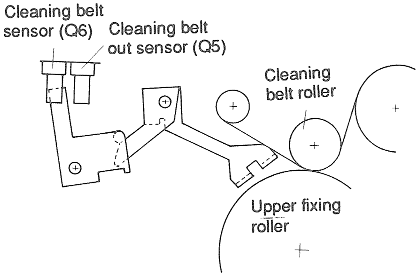
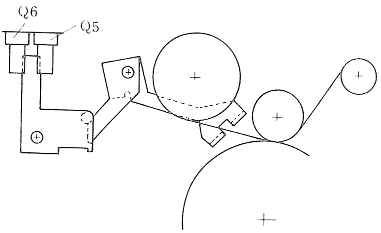
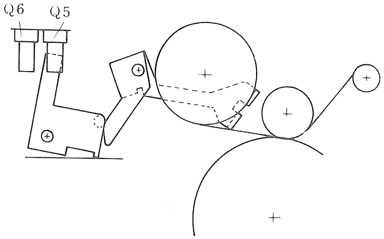
	Photointerrupters		Indication on control panel	
	Q6	Q5		
Before detection	ON	OFF		 Cleaning belt sensor (Q6) Cleaning belt out sensor (Q5) Cleaning belt roller Upper fixing roller
After detection of shorter notch	ON	OFF	WARNINGduring warm-up;about 54000, a equivalent of about 54000 copies. *Only in response to a press on SW605 on the SW/VR PCB. (service mode).	
After detection of longer notch	ON	OFF	E005	

Figure 3-88

I. DETECTING JAMS

1. Outline

Figure 3-89 shows the eleven sensors that serve to monitor the movement of copy paper. These sensors send signals to the microprocessor, which in turn reads the signals at such times as programmed in advance; when the microprocessor identifies a jam, it immediately stops the on-going copy operation.

After the copy operation is stopped, the JAM message is indicated on the control panel and, at the same time, the jam location indicator inside the copier shows the location of the jam.

When the copier is switched ON after removal of a jam, the same sequence that is executed at time of power-on will be executed to prepare for the next copy run.

The microprocessor identifies a jam under the following conditions:

a. Copy paper exists around any of the sensors at time of power-on, upon completion of warm-up, or during standby.

b. Copy paper exists around the fixing assembly paper sensor (Q10) during copy operation.

c. Copy paper fails to reach a specific sensor within a specified period of time.
① Delay jam; by delivery assembly paper sensor (Q3, Q4, Q14).
② Delay jam; by first path sensor (DQ8).
③ Delay jam; by overlay copy paper delivery sensor (DQ1, DQ2, DQ3).
④ Delay jam; by two-sided copy paper delivery sensor (DQ5).
⑤ Delay jam; by 2nd side copy pick-up sensor (DQ6).
⑥ Delay jam; by paper feed sensor (Q11).

d. Copy paper fails to pass a specific sensor within a specific period of time.
① Stationary jam; by delivery assembly paper sensor (Q3, Q4, Q14).
② Stationary jam; by overlay copy paper delivery sensor (DQ1, DQ2, DQ3).
③ Stationary jam; by two-sided copy paper delivery sensor (DQ5).
④ Stationary jam; by 2nd side copy pick-up sensor (DQ6).
⑤ Stationary jam; by paper feed sensor (Q11).

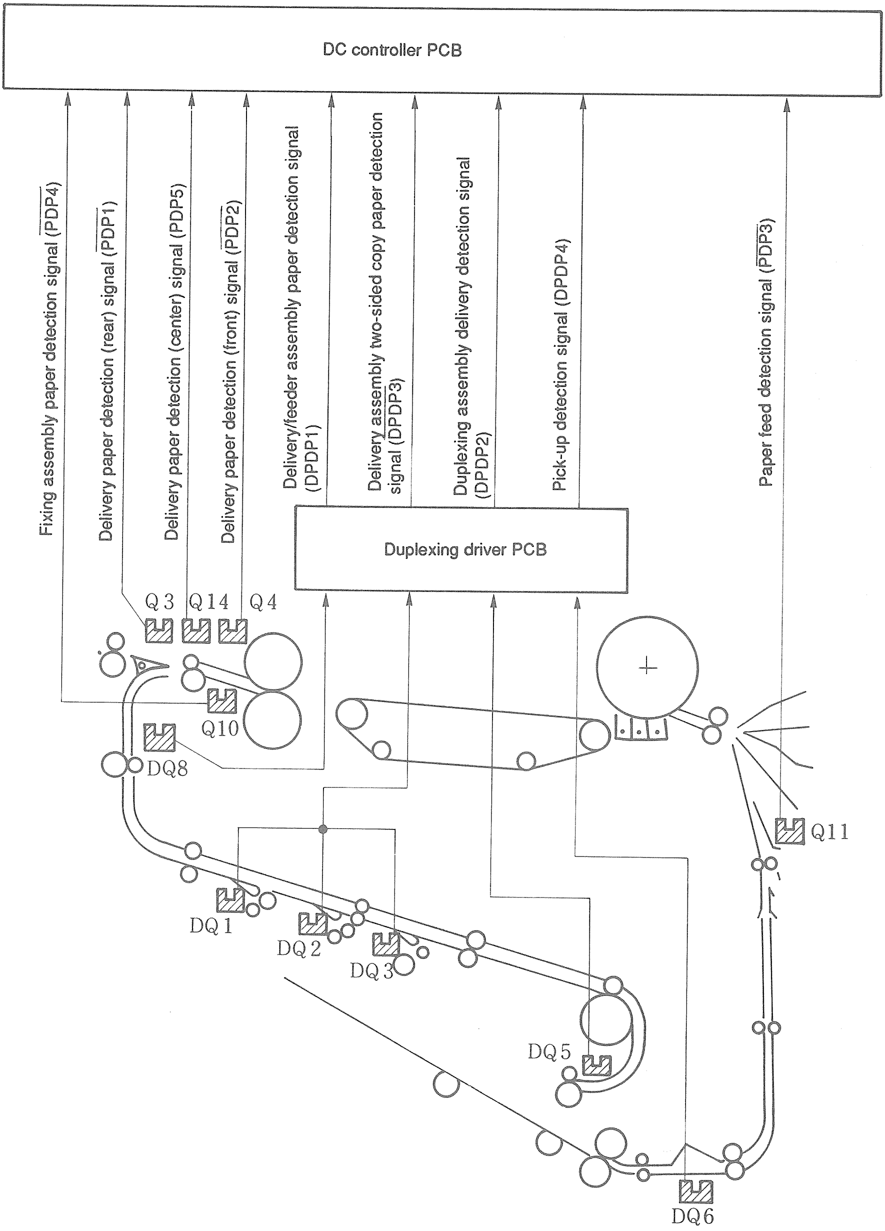

DC controller PCB
Fixing assembly paper detection signal ($\overline{\text{PDP4}}$)
Delivery paper detection (rear) signal ($\overline{\text{PDP1}}$)
Delivery paper detection (center) signal (PDP5)
Delivery paper detection (front) signal ($\overline{\text{PDP2}}$)
Delivery/feeder assembly paper detection signal (DPDP1)
Delivery assembly two-sided copy paper detection signal ($\overline{\text{DPDP3}}$)
Duplexing assembly delivery detection signal (DPDP2)
Pick-up detection signal (DPDP4)
Paper feed detection signal ($\overline{\text{PDP3}}$)
Duplexing driver PCB
Q3
Q14
Q4
Q10
DQ8
Q11
DQ1
DQ2
DQ3
DQ5
DQ6

Figure 3-89

2. Checking Jams at the Outlet of the Delivery Assembly

a. Outlet Delay Jam

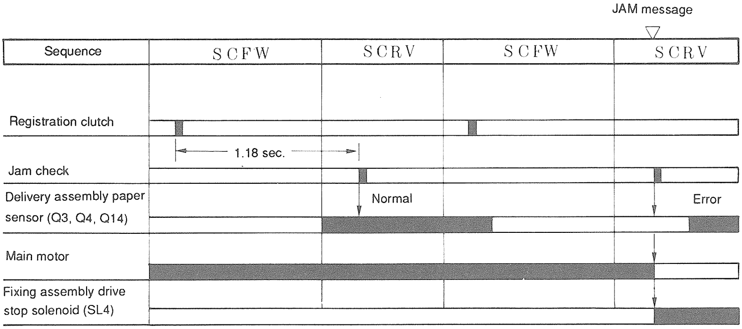

JAM message
Sequence
SCFW
SCRV
SCFW
SCRV
Registration clutch
1.18 sec.
Jam check
Delivery assembly paper sensor (Q3, Q4, Q14)
Normal
Error
Main motor
Fixing assembly drive stop solenoid (SL4)

Figure 3-90

b. Outlet Stationary Jam

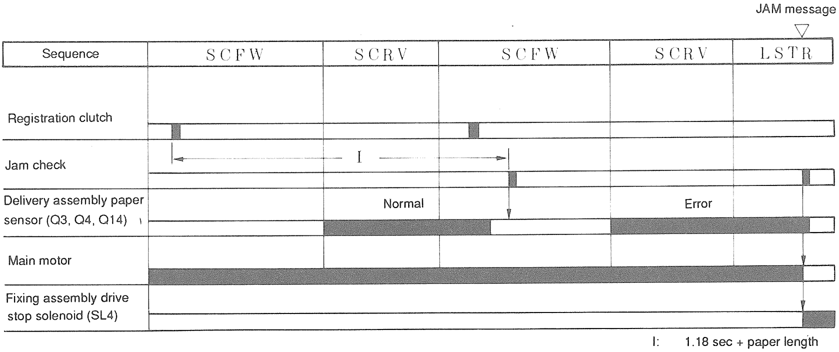

JAM message
Sequence
SCFW
SCRV
SCFW
SCRV
LSTR
Registration clutch
I
Jam check
Delivery assembly paper sensor (Q3, Q4, Q14)
Normal
Error
Main motor
Fixing assembly drive stop solenoid (SL4)
I: 1.18 sec + paper length

Figure 3-91

3. Checking Jams in the Delivery/Feeder Assembly

a. First Path Delay Jam

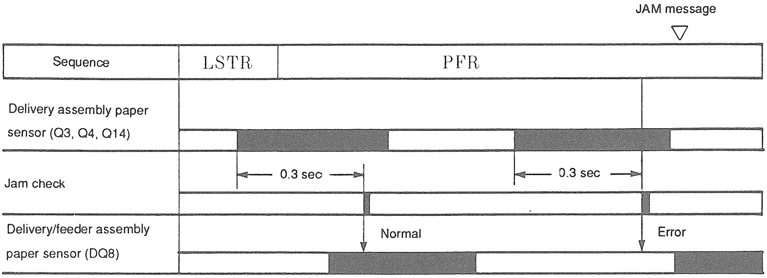

JAM message
Sequence
LSTR
PFR
Delivery assembly paper sensor (Q3, Q4, Q14)
Jam check
0.3 sec
0.3 sec
Delivery/feeder assembly paper sensor (DQ8)
Normal
Error

Figure 3-92

4. Checking Jams for Overlay Copies in the Delivery Assembly

a. Overlay Copy Delay Jam

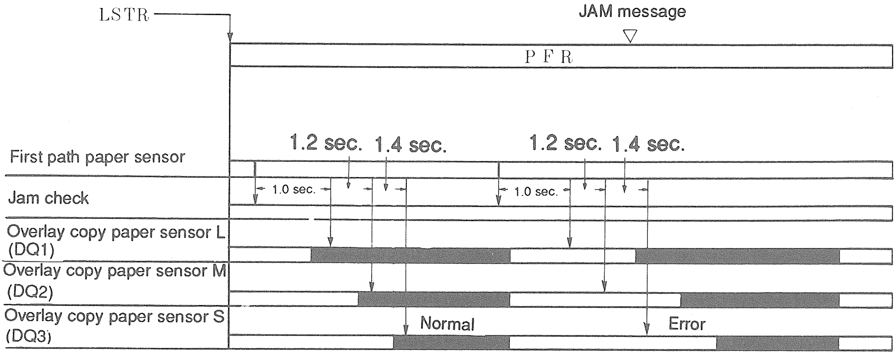
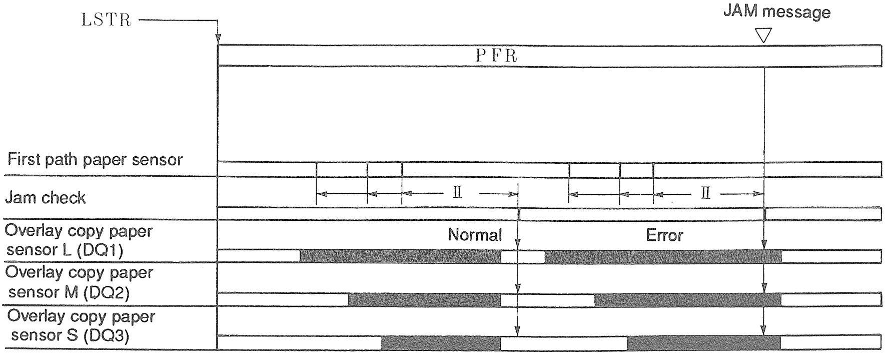

LSTR
JAM message
PFR
1.2 sec.
1.4 sec.
1.2 sec.
1.4 sec.
First path paper sensor
Jam check
1.0 sec.
1.0 sec.
Overlay copy paper sensor L (DQ1)
Overlay copy paper sensor M (DQ2)
Overlay copy paper sensor S (DQ3)
Normal
Error

Figure 3-93

b. Overlay Copy Stationary Jam


LSTR
JAM message
PFR
First path paper sensor
Jam check
II
II
Overlay copy paper sensor L (DQ1)
Normal
Error
Overlay copy paper sensor M (DQ2)
Overlay copy paper sensor S (DQ3)

II: Length of paper.

Figure 3-94

5. Checking Jams for Two-Sided Copies in the Delivery Assembly

a. Two-Sided Copy Delay Jam

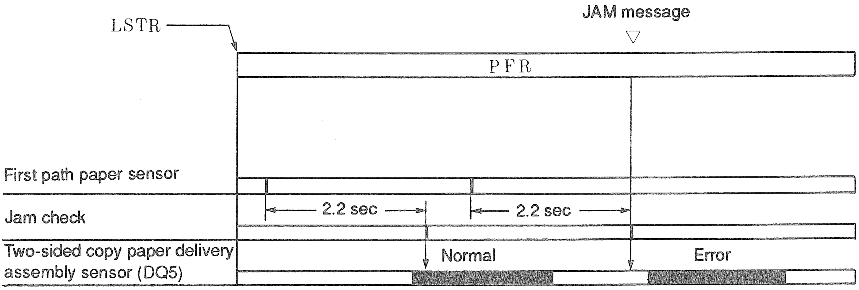
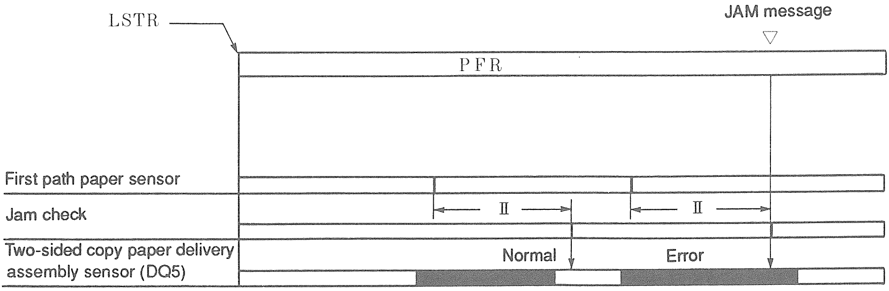

LSTR
JAM message
PFR
First path paper sensor
Jam check
2.2 sec
2.2 sec
Two-sided copy paper delivery assembly sensor (DQ5)
Normal
Error

Figure 3-95

b. Two-Sided Copy Stationary Jam


LSTR
JAM message
PFR
First path paper sensor
Jam check
ℓ
ℓ
Two-sided copy paper delivery assembly sensor (DQ5)
Normal
Error

ℓ: Length of paper.

Figure 3-96

6. Checking Jams for 2nd-Side Copies at Pick-Up

a. 2nd-Side Pick-Up Delay Jam

A delay jam is identified if copy paper fails to reach the pick-up paper sensor for about 2.1 seconds after the pick-up clutch (DCL1) has gone OFF.

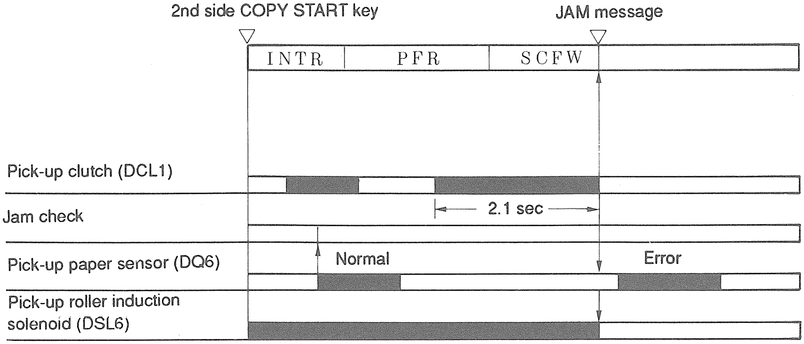

2nd side COPY START key
JAM message
INTR
PFR
SCFW
Pick-up clutch (DCL1)
Jam check
2.1 sec
Pick-up paper sensor (DQ6)
Normal
Error
Pick-up roller induction solenoid (DSL6)

Figure 3-97

b. 2nd-Side Pick-Up Stationary Jam

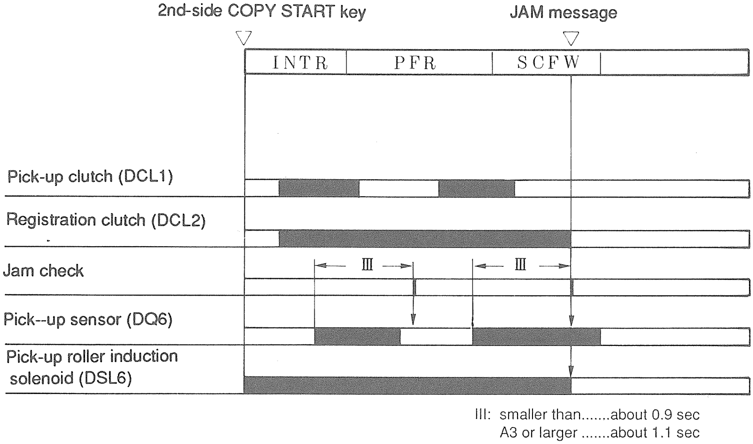

2nd-side COPY START key
JAM message
INTR
PFR
SCFW
Pick-up clutch (DCL1)
Registration clutch (DCL2)
Jam check
III
III
Pick--up sensor (DQ6)
Pick-up roller induction solenoid (DSL6)
III: smaller than.......about 0.9 sec
A3 or larger ....about 1.1 sec

Figure 3-98

7. Checking Jams in the Feeder Assembly

a. 2nd-Side Delay Jam

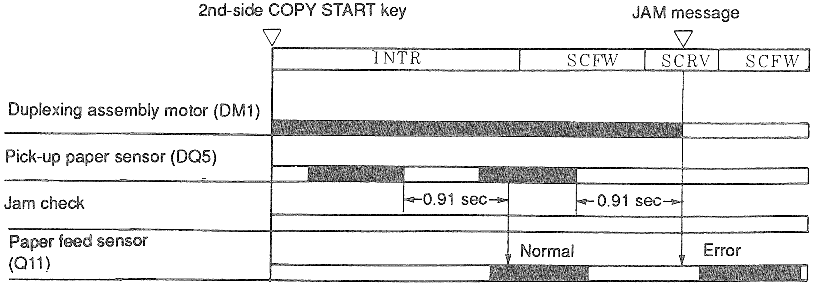

2nd-side COPY START key
JAM message
INTR
SCFW
SCRV
SCFW
Duplexing assembly motor (DM1)
Pick-up paper sensor (DQ5)
Jam check
0.91 sec
0.91 sec
Paper feed sensor (Q11)
Normal
Error

Figure 3-99

b. 2nd-Side Stationary Jam

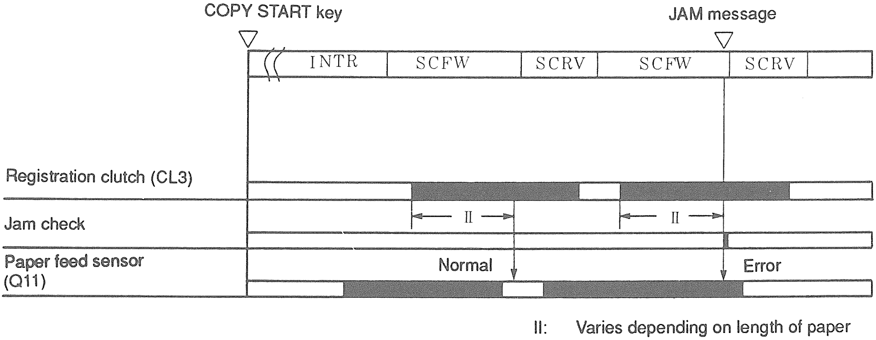

COPY START key
JAM message
INTR
SCFW
SCRV
SCFW
SCRV
Registration clutch (CL3)
Jam check
II
II
Paper feed sensor (Q11)
Normal
Error
II: Varies depending on length of paper

Figure 3-100

VI. POWER SUPPLY

A. OUTLINE OF POWER SUPPLY

Figure 3-101 is a block diagram that shows the distribution of power for the copier.

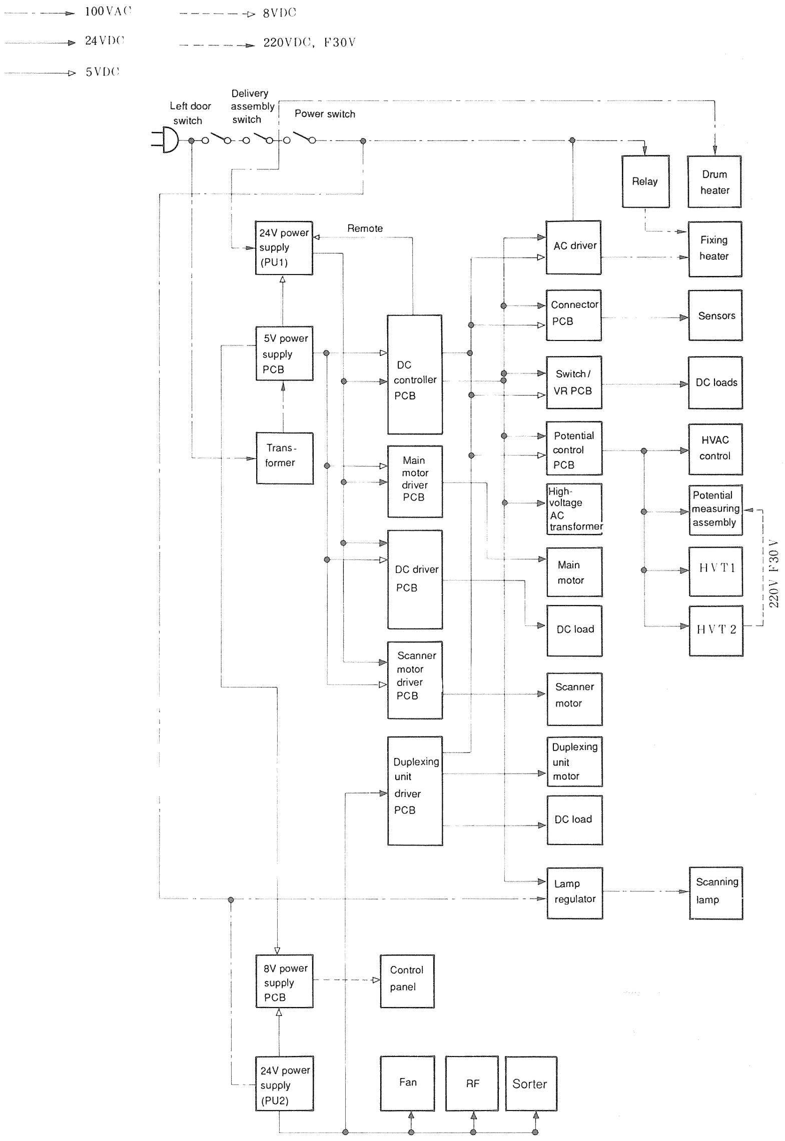

100VAC
24VDC
5VDC
8VDC
220VDC, F30V
Left door switch
Delivery assembly switch
Power switch
Relay
Drum heater
24V power supply (PU1)
Remote
AC driver
Fixing heater
Connector PCB
Sensors
5V power supply PCB
DC controller PCB
Switch / VR PCB
DC loads
Potential control PCB
HVAC control
Trans-former
Main motor driver PCB
High-voltage AC transformer
Potential measuring assembly
DC driver PCB
Main motor
HVT1
DC load
HVT2
220V F30V
Scanner motor driver PCB
Scanner motor
Duplexing unit driver PCB
Duplexing unit motor
DC load
Lamp regulator
Scanning lamp
8V power supply PCB
Control panel
24V power supply (PU2)
Fan
RF
Sorter

Figure 3-101

B. POWER SUPPLY CIRCUIT

As along as the power plug is connected to the outlet, the 5V power supply unit remains activated through transformers. The microprocessor on the DC controller PCB will be provided with the 5V power even if the power switch, left door switch, or delivery assembly switch is OFF because of a jam so that the microprocessor can retain its memory.

The copier is equipped with two 24V power supply PCBs; PU1 serves the copier, and PU2 serves the duplexing unit, RDF, and sorter; the control panel is supplied with 8V power.

The diagrams given as APPENDIX show five types of 24V power; the destination and accuracy of each are as shown in Table 3-16.

	Type	Destination	Accuracy
1	24VA	Main motor	24 VDC ±5%
2	24VB	Scanner motor	
3	24VC	High-voltage loads	
4	24VD	Drive, DC controller PCB	
5	24VE	Potential control, DC controller control	24 VDC ±1%

Table 3-16

Note:

'F' of F30 VDC stands for *floating*, and the reference line of the power supply is not grounded, i.e., not 0 V.

The 5V power supply unit is equipped with a breaker (CB501) as an overcurrent protection device; if an overcurrent flows because of a short on the power line, CB501 goes ON to cut off the output of the 5V power unit. If this happens, disconnect the power plug, remove the cause, and reset the breaker.

PU1 and PU2 of the 24V power supply PCB are each equipped with a fuse on its AC line; the stabilizer power supply circuit has an overcurrent protection circuit; when a short occurs on the power line and, as a result, an overcurrent flows, the protection circuit goes ON to cut out the output of the power supply unit. If this happens, disconnect the power plug, remove the cause, and switch the copier ON. The protection circuit will be reset when the AC power of the power supply unit is kept OFF about 30 seconds and is turned ON thereafter.

Note:

An overcurrent in the output of the power supply unit causes the protection circuit to go ON before the fuse of the AC input blows; the fuse may melt, however, if the AC power supply is turned ON and OFF repeatedly without removing the cause of the short.

The output of the 24V power supply PCB (PU1) is linked with the output of the 5V power supply assembly. For this reason, if the breaker (CB501) of the 5V power supply unit goes ON and the output of the 5V power supply goes OFF as a result, the output of PU1 will be OFF even when PU1 is provided with AC power. As such, it is important to check the output of the 5V power supply unit if the output of PU1 is OFF.

The 24V power supply PCB (PU1) is controlled by the remote signal from the DC controller; the copier will not be provided with 24V power without the signal.

C. POWER SUPPLY FOR DATE AND TIME INDICATION

To retain the date/time indication memory when the power plug is disconnected, a lithium battery is used as a backup power supply.

The battery lasts about five years with the power plug disconnected. When its life is over, however, the time/date indication will remain still until the power plug is reconnected.

VII. OPERATIONS TABLE

OPERATIONS TABLE (1/3; w/o sorter)

	Book mode	W / RDF		W / RDF and Sub Feeder
		Description	Operation	Operation
Non-sort mode	The setting may be as high as '999'; however, the tray can hold no more than about 250 sheets.		➡	➡
Sort mode	—	The recycle mode of the RDF is executed.	The setting may be as high as '30'; the limit is a consideration against damage to the original.	➡
Group mode	—		The setting may be as high as '999'; however, the tray can hold no more than about 250 sheets.	➡

Figure 3-17

OPERATIONS TABLE (2/3 in 0ne-sorter configuration)

If the sub feeder is used, note that 'JOB No. 1' represents the copying operation on the originals in the RDF and 'JOB No. 2' that in the sub feeder; descriptions in parentheses apply to large-size paper.

<table>
<tr><th rowspan="2"></th><th rowspan="2">Book mode</th><th colspan="2">W / RDF</th><th colspan="2">W / RDF and Sub Feeder</th></tr>
<tr><th>Description</th><th>Operation</th><th>Description (JOB No. 2)</th><th>Operation (JOB No. 2)</th></tr>
<tr><td>Non-sort mode</td><td>The setting maybe as high as '999'; however, if '251', or more, delivery is to the sort bin. (See Note i.)</td><td></td><td>• If the setting is lower than '251', the sheets will be delivered to the non-sort tray.
• If the settling is '251' or higher, the sheets will be delivered to the sort bin (GROUP). (If the last bin has received the sheets, the separation will stop; the operation resumes automatically when all the sheets from the bins are removed.)</td><td></td><td><table>
<tr><th>Copy mode (JOB No. 1)</th><th>Operation (JOB No. 2)</th></tr>
<tr><td>Sort / Group / Staple sort</td><td>• If the setting is lower than '251', the sheets will be delivered to the non-sort tray.
• If the setting is '251' or more, a message will be displayed at the start of JOB No. 2; i.e., in response to a press on the COPY START key.</td></tr>
<tr><td>Non-sort</td><td>• The operation stops once at the start of JOB No. 2 and resumes in response to a press on the COPY START key.</td></tr>
</table></td></tr>
<tr><td>Sort mode</td><td>The setting may be as high as '20'; the limit is to comply with the number of bins.</td><td>1. No limit is imposed on the setting; however, the operation stops upon completion (copying) of 20 sets and starts again automatically when the sheets are removed.
2. The number of originals is limited to comply with the capacity of the sorter bins.</td><td><table>
<tr><th>Originals / Setting</th><th>1</th><th>2~60</th><th>61~</th></tr>
<tr><td>1</td><td colspan="3">The non-sort operation is executed</td></tr>
<tr><td>2~20</td><td rowspan="2">The setting may be varied; see Note 2.</td><td>The sort operation is executed.</td><td rowspan="2">After copying an equivalent of 60 originals, a message will be displayed.</td></tr>
<tr><td>21~</td><td>After copying20 sets, a message will be displayed.</td></tr>
</table></td><td>•Copying operation starts, skipping a single bin.
•If the bins are not enough, the operation stops and a messege is displayed.</td><td><table>
<tr><th>Originals / Setting</th><th>1 ~ 60</th><th>61 ~</th></tr>
<tr><td>Lower than the remaining number of bins.</td><td>The sort operation is executed, skipping a single bin.</td><td rowspan="3">After copying an equivalent of 60 originals, a message will be displayed.</td></tr>
<tr><td>Same as the remaining number of bins.</td><td>The sort operation is executed without skipping a single bin.</td></tr>
<tr><td>Higher than the remaining number of bins.</td><td>The sort operation is executed skipping a single bin; then, after delivery to the last bin, a message will be displayed.</td></tr>
</table></td></tr>
<tr><td>Group mode</td><td>The setting may be as high as '30', (25); the limit is to comply with the capacity of the bins.</td><td>1. The setting is limited to comply with the capacity of the sorter bins.
2. No limit is imposed on the number of originals; however, the operation stops upon completion (copying) of 20 sets and starts again automatically when the sheets are removed.</td><td><table>
<tr><th>Originals / Setting</th><th>1</th><th>2~20</th><th>21~</th></tr>
<tr><td>1</td><td colspan="3">The non-sort operation is executed.</td></tr>
<tr><td>2~30 [25]</td><td>The setting may be varied; see Note ii.</td><td>The group operation is executed</td><td>After copying an equivalent of 20 originals, a message will be displayed.</td></tr>
<tr><td>31 ~ [26]</td><td colspan="3">A message is displayed in response to a press on the COPY START key</td></tr>
</table></td><td>The same as the sort mode.</td><td><table>
<tr><th>Originals / Setting</th><th>Fewer than the remaining number of bins</th><th>More than the remaining number of bins</th></tr>
<tr><td>1 ~ 30 [25]</td><td>The group operation is executed skipping a single bin.</td><td>The group operation is executed skipping a single bin; then, a message is displayed after delivery to the last bin.</td></tr>
<tr><td>31~ [26]</td><td colspan="2">A message is displayed at the start of the consecutiive mode.</td></tr>
</table></td></tr>
<tr><td>Staple sort mode</td><td>The setting may be as high as '20'; the limit is to comply with the number of bins.</td><td>1. No limit is imposed on the setting; however, the operation stops upon completion (copying/stapling) of 20 sets and starts again automatically when the sheets are
2. removed.
The number of originals is limited to comply with the staping capability of the sorter.</td><td><table>
<tr><th>Originals / Setting</th><th>1</th><th>2~50</th><th>51~</th></tr>
<tr><td>1</td><td>The non-sort operation is executed.</td><td rowspan="2">The staple sort operation is executed.</td><td rowspan="3">No stapling operation is executed.</td></tr>
<tr><td>2~20</td><td rowspan="2">The setting may be varied; see Note ii.</td></tr>
<tr><td>21</td><td>After stapling 20 sets, a message is displayed.</td></tr>
</table></td><td>The same as the sort mode.</td><td><table>
<tr><th>Originals / Setting</th><th>1 ~ 50</th><th>51 ~</th></tr>
<tr><td>Lower than the remaining number of bins</td><td>The staple sort operation is executed without skipping a single bin.</td><td rowspan="3">No stapling is executed.</td></tr>
<tr><td>Same as the remaining number of bins</td><td>The staple sort operation is executed without skipping a single bin.</td></tr>
<tr><td>More than the remaining number of bins</td><td>The sort operation is executed, skipping a single bin; a message will be displayed after delivery to the last bin.</td></tr>
</table></td></tr>
</table>

Note I:
If in the page separation mode, the operation is identical to that when the RDF is used.

Note II:
In the service mode, the non-sort operation, in which the sheets are delivered to the non-sort tray, and the sort operation, in which they are delivered to the bins, may be switched over.

Note III:
If the copy paper (horizontal) of JOB No. 2 is smaller than the copy paper (horizontal) of JOB No. 1 and, in addition, both are delivered to the same sorter, the copy paper of JOB No. 2 will not be stapled.

OPERATIONS TABLE (3/3; In two-sorter configuration)

If the sub feeder is used, note that 'JOB No. 1' represents the copying operations on the originals in the RDF and 'JOB No. 2' that in the sub feeder; descriptions in parentheses apply to large-size paper.

<table>
<tr><th rowspan="2"></th><th rowspan="2">Book mode</th><th colspan="2">W / RDF</th><th colspan="2">W / RDF and Sub Feeder</th></tr>
<tr><th>Description</th><th>Operation</th><th>Description (JOB No. 2)</th><th>Operation (JOB No. 2)</th></tr>
<tr><td>Non-sort mode</td><td>The setting maybe as high as '999'; however, if '251', or more, delivery is to the sort bin. (See Note i.)</td><td></td><td>• If the setting is lower than '251', the sheets will be delivered to the non-sort tray.
• If the settling is '251' or higher, the sheets will be delivered to the sort bin (GROUP). (If the last bin has received the sheets, the separation will stop; the operation resume automatically when all the sheets from the bins are removed.)</td><td>If the setting is lower than '251', the delivery is to the non-sort tray of the first sorter. If '251' or higher, the delivery is to the second sorter (GROUP).</td><td><table>
<tr><th>Copy mode (JOB No. 1)</th><th>Operation (JOB No. 2)</th></tr>
<tr><td>Sort / Group / Staple sort</td><td>• If the setting is lower than '250', the sheets will be delivered to the non-sort tray.
• If the setting is '250' or more, the sheets will be delivered to the second sorter using the GROUP operation.</td></tr>
<tr><td>Non-sort</td><td>• The operation stops once at the start of JOB No. 2 and resumes in response to a press on the COPY START key.</td></tr>
</table></td></tr>
<tr><td>Sort mode</td><td>The setting may be as high as '40'; the limit is to comply with the number of bins.</td><td>1. No limit is imposed on the setting; however the operation stops upon completion (copying) of 20 sets and starts again automatically when the sheets are removed. (See Note iv.)
2. The number of originals is limited to comply with the capacity of the sorter bins.</td><td><table>
<tr><th>Setting \ Originals</th><th>1</th><th>2~60</th><th>61~</th></tr>
<tr><td>1</td><td colspan="3">The non-sort operation is executed.</td></tr>
<tr><td>2~40</td><td rowspan="2">The setting may be varied; see Note ii.</td><td>The sort operation is executed 20 sets each.</td><td rowspan="2">After copying an equivalent of 60 originals, a message will be displayed.</td></tr>
<tr><td>21~</td><td>After copying 40 sets, a message will be displayed.</td></tr>
</table></td><td>•As a rule, the delivery is to the second sorter; however, if any of the bins in the first sorter is empty, the delivery is back to the first sorter after delivery to the second sorter.
• If delivery of JOB 1 and JOB 2 is to the same sorter, a single bin will be skipped.</td><td>See Figure 3-101.</td></tr>
<tr><td>Group mode</td><td>The setting may be as high as '30', (25); the limit is to comply with the capacity of the bins.</td><td>1. The setting is limited to comply with the capacity of the sorter bins.
2. No limit is imposed on the number of originals; however, the operation stops upon completion (copying) of 40 sets and starts again automatically when the sheets are removed.</td><td><table>
<tr><th>Setting \ Originals</th><th>1</th><th>2~40</th><th>41~</th></tr>
<tr><td>1</td><td colspan="3">The non-sort operation is executed.</td></tr>
<tr><td>2~30
[25]</td><td>The setting may be varied; see Note ii.</td><td>The group operation is executed.</td><td>After copying an equivalent of 40 originals, a message will be displayed.</td></tr>
<tr><td>31 ~
[26]</td><td colspan="3">A messege is displayed in response to a press on the COPY START key.</td></tr>
</table></td><td>The same as the sort mode.</td><td>See Figure 3-101.</td></tr>
<tr><td>Staple sort mode</td><td>The setting may be as high as '40', the limit is to comply with the number of bins. (manual stapling)</td><td>1. No limit is imposed on the setting; however, the operation stops upon completion (copying/stapling) of 20 sets and starts again automatically when the sheets are removed.
2. The number of originals is limited to comply with the stapling capability of the sorter.</td><td><table>
<tr><th>Setting \ Originals</th><th>1</th><th>2~50</th><th>51~</th></tr>
<tr><td>1</td><td>The non-sort operation is executed.</td><td rowspan="2">The staple sort operation is executed for each 20 sets.</td><td rowspan="3">No stapling operation is executed.</td></tr>
<tr><td>2~40</td><td rowspan="2">The setting may be varied; see Note ii.</td></tr>
<tr><td>41~</td><td>After stapling 40 sets, a message is displayed.</td></tr>
</table></td><td>The same as the sort mode.</td><td>See Figure 3-101; see Note iii.</td></tr>
</table>

Note I:
If in the page separation mode, the operation is identical to that when the RDF is used.

Note II:
In the service mode, the non-sort operation, in which the sheets are delivered to the non-sort tray, and the sort operation, in which they are delivered to the bins, may be switched over.

Note III:
If the copy paper (horizontal) of JOB No. 2 is smaller than the copy paper (horizontal) of JOB No. 1 and, in addition, both are delivered to the same sorter, the copy paper of JOB No. 2 will not be stapled.

Note IVI:
One of the two sorters will be used; first 20 copies are made and delivered to the first sorter and , then another 20 copies are made and delivered to the second sorter, stopping the operation. If all the copies are removed from the first sorter during delivery to the second sorter, the machine will continue to operate, copying 20 copies and delivering them to the first sorter.

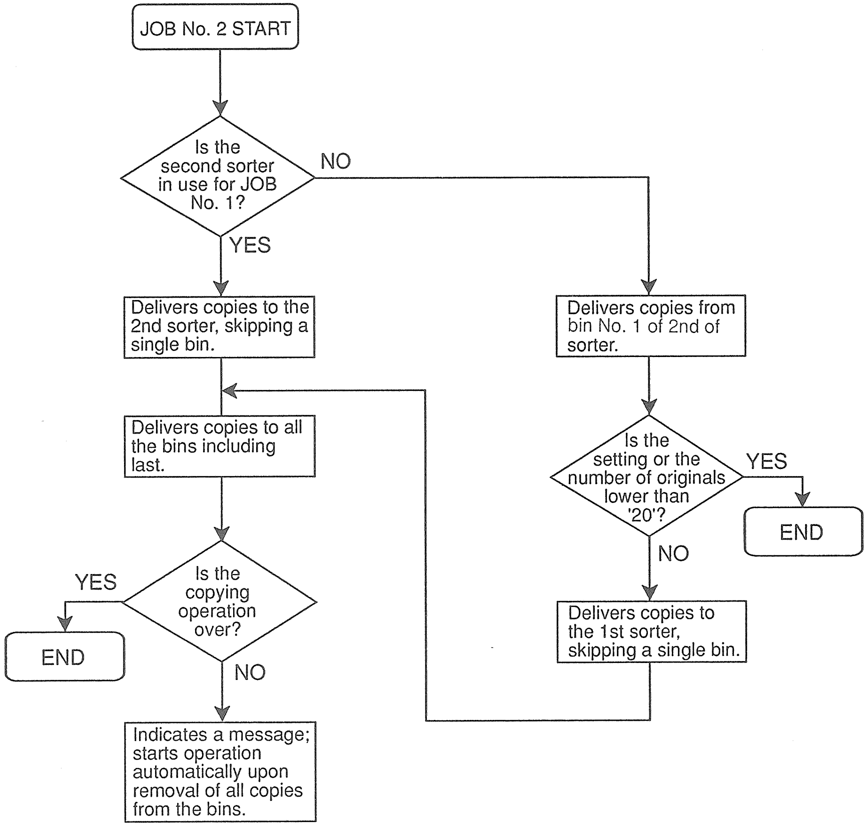

JOB No. 2 START
Is the second sorter in use for JOB No. 1?
NO
YES
Delivers copies to the 2nd sorter, skipping a single bin.
Delivers copies from bin No. 1 of 2nd of sorter.
Delivers copies to all the bins including last.
Is the setting or the number of originals lower than '20'?
YES
END
NO
Delivers copies to the 1st sorter, skipping a single bin.
YES
Is the copying operation over?
END
NO
Indicates a message; starts operation automatically upon removal of all copies from the bins.

Figure 3-101

VIII. SERVICE MODE

A. OUTLINE

The copier has the following seven service modes.

No.	Mode
* 1 *	Display mode
* 2 *	I/O display mode
* 3 *	VR adjustment mode
* 4 *	Switch mode
* 5 *	Specifications setting mode
* 6 *	Counter mode
* 7 *	APC volume adjustment mode

Table 3-20

Each mode has items discussed on the pages that follow, and each item may be checked on the message display.

B. USING THE SERVICE MODE

1) Open the front doors, and insert the door switch actuator.
2) Detach the cover shown in Figure 3-102, and check SW605 on the switch/VR PCB.

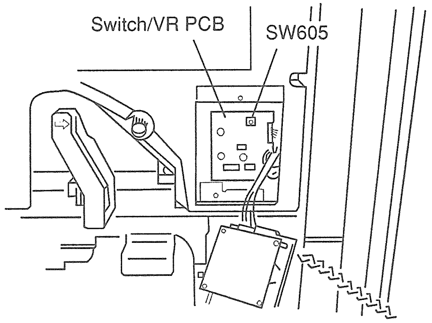


Figure 3-102

3) Press SW605, and check that '$' is shown on the right side of the message display.
4) Enter the No. of the mode (Table 3-20) using the input keypad and asterisk key; e.g., * → 3 → *
5) Enter the No. of the item using the ZOOM keys (-, +) or input keypad.
6) Check the data or make adjustments.
7) Leave the service mode.
- RESET key ON
- Main switch OFF
- Auto celar
- Auto shut-off

C. USING THE VOLUME ADJUSTMENT MODE AND SPECIFICATIONS SETTING MODE

Using the volume adjustment mode and specifications setting mode, some operations executed from the control panel may be stored into the RAM on the DC controller PCB; with this function, the modes may be made to serve as variable resistors and switches.

Figure 3-45 represents the label attached behind the copier's left cover.

Each copier is adjusted at the factory, and the settings made are recorded on the label.

When the DC controller PCB has been replaced or the RAM has been cleared, enter the settings shown on the label; in addition, record any settings made newly in the field.

ADDRESS	TYP		
SV-1			
SV-2	0		
SV-3			
SV-4			
SV-5			
SV-6			
SV-7			
SV-8			
SV-9	2		
SV-10	2		
SV-11	3		
SV-12			
SV-13			
SV-14	0		
SV-15			
SV-16	0		
SV-17	3		
SV-18			
SV-19			
MS-0	120M		
MS-1	1		
MS-2	0		
MS-3	1		
MS-4	1		
MS-5	1		
MS-6	0		
MS-7	0		
MS-8	0		
MS-9	1		
MS-10	3		
MS-11	0		
MS-12	0		
MS-13	0		
MS-14	0		
MS-15	1		
MS-16	0		
MS-17	0		
MS-18	0		
MS-19	0		

Figure 3-103

D. DISPLAY MODE (※ 1 ※)

Select the addresses using the ZOOM keys.

Display Example
SD-00 Ver 0023
↑ Address No. ↑ Description

<table>
<tr><th>Address</th><th>Item</th><th>Display/Notation</th></tr>
<tr><td>SD-00</td><td>Shows the version No. of ROMs Q107, Q108, and Q118 on the DC controller PCB.</td><td>Ver. 0021 JUN 6 1988</td></tr>
<tr><td>SD-01</td><td>Shows the version No. of Q158 on the DC controller PCB.</td><td>001</td></tr>
<tr><td>SD-02</td><td>Shows the language of the messages.</td><td>Japanese/English</td></tr>
<tr><td>SD-04</td><td>Shows the version No. of U1 on the control panel PCB.</td><td></td></tr>
<tr><td>SD-05</td><td>Shows the version No. of the microprocessor of the RDF.</td><td></td></tr>
<tr><td>SD-06</td><td>Shows the version No. of the microprocessor of the sorter.</td><td></td></tr>
<tr><td>SD-07</td><td>Shows the version No. of the message ROM.</td><td>004</td></tr>
<tr><td>SD-10</td><td>Shows the temperature of the fixing assembly. (measurements of TH1)</td><td>in °C.</td></tr>
<tr><td>SD-11</td><td>Shows the ambient temperature. (measurements of TH601)</td><td>in °C.</td></tr>
<tr><td>SD-12</td><td>Shows the temperature of the scanner motor.</td><td>in °C.</td></tr>
<tr><td>SD-14</td><td>For factory use.</td><td></td></tr>
<tr><td>SD-15</td><td>Shows the location of jams in the copier.</td><td>
<table>
<tr><th>No.</th><th colspan="2">Type of jam</th></tr>
<tr><td>00</td><td colspan="2">Delay; delivery sensor (Q3, Q14)</td></tr>
<tr><td>01</td><td colspan="2">Stationary; delivery sensor (Q3, Q14)</td></tr>
<tr><td>02</td><td colspan="2"></td></tr>
<tr><td>03</td><td colspan="2">Fixing assembly paper sensor (Q10)</td></tr>
<tr><td>04</td><td colspan="2">Delay; delivery/feeder assembly paper sensor (Q8)</td></tr>
<tr><td>05</td><td colspan="2">Stationary; delivery/feeder assembly paper sensor (Q8)</td></tr>
<tr><td>06</td><td>Delay; overlay delivery paper sensor (Q1, Q2, Q3)</td><td rowspan="4">Duplexing unit</td></tr>
<tr><td>07</td><td>Stationary; overlay delivery paper sensor (Q1, Q2, Q3)</td></tr>
<tr><td>08</td><td>Delay; two-sided delivery paper sensor (Q5)</td></tr>
<tr><td>09</td><td>Stationary; two-sided delivery paper sensor (Q5)</td></tr>
</table>
</td></tr>
</table>

Table 3-21

<table>
<tr><th>Address</th><th>Item</th><th>Display/Notation</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><th>No.</th><th>Type of jam</th></tr>
<tr><td>10</td><td>Paper deck</td></tr>
<tr><td>11</td><td>–</td></tr>
<tr><td>12</td><td>Delay; pick-up sensor (Q6)</td></tr>
<tr><td>133</td><td>Stationary; pick-up sensor (Q6)</td></tr>
<tr><td>14</td><td>Delay; feeder assembly paper sensor (Q11)</td></tr>
<tr><td>15</td><td>Stationary; feeder assembly paper sensor (Q11)</td></tr>
</table>
</td></tr>
<tr><td>SD-16</td><td>Shows the location of jams in options.</td><td>
<table>
<tr><th>No.</th><th>Type of jam</th></tr>
<tr><td>01</td><td>When the front right door is opened.</td></tr>
<tr><td>02</td><td>In the RDF</td></tr>
<tr><td>03</td><td>In the RDF; or when the front right door is opened.</td></tr>
<tr><td>04</td><td>In the sorter</td></tr>
<tr><td>05</td><td>In the sorter; or when the front right door is opened.</td></tr>
<tr><td>06</td><td>In the RDF; or in the sorter.</td></tr>
<tr><td>07</td><td>In the RDF/sorter; or when the front right door is opened.</td></tr>
</table>
</td></tr>
<tr><td>SD-17</td><td>Shows the location of jams in the RDF.</td><td>See Table 3-26.</td></tr>
<tr><td>SD-18</td><td>Shows the location of jams in the sorter.</td><td>See Table 3-27.</td></tr>
<tr><td>SD-20</td><td>Shows the scanning lamp ON voltage limit (warning).</td><td>1 : The ON voltage is at the limit.
0 : Normal.</td></tr>
<tr><td>SD-21</td><td>Shows the primary corona current limit (warning).</td><td>1 : The application current is at the limit.
0 : Normal.</td></tr>
<tr><td>SD-22</td><td>Shows the measurement and target setting for VL1 (light area potential).</td><td>In 2.5V increment (e.g., 187.5V).</td></tr>
</table>

Table 3-23

Address	Item	Display/Notation
SD-23	Shows the setting and target setting for VL2.	In 2.5V increment; e.g., 72.5V.
SD-24	Shows the measurement and target setting of VD (dark area potential).	In 2.5V increment; e.g., 442.5V.
SD-25	Shows the setting of VAE (AE measurement potential).	Represents the surface potential of the drum (potential of the original) measured during AE.
SD-26	Shows the surface potential of the drum.	Shows the surface potential of the drum during copying operation; at all times.
SD-27	Shows the contrast potential of the surface of the drum; VD-VL2.	
SD-28	Shows the setting for the primary current.	
SD-29	For factory use.	
SD-30	Shows the ON voltage of the scanning lamp (110V model).	
SD-31	Shows the ON voltage of the scanning lamp (115V model).	
SD-32	Shows the ON voltage of the scanning lamp (220V model).	
SD-33	Shows the ON voltage of the scanning lamp (240V model).	
SD-35	Use it to check the operation of the developing assembly and hopper unit.	No. — Description 00 — When the hopper unit is supplying the developing assembly with toner; for 6 min, at time of installation. 10 — When the hopper motor is at rest. 20 — When the toner inside the hopper unit is being stirred. 30 — When the hopper unit is supplying the developing assembly with toner.
SD-36	Shows the input from the toner sensor in the hopper unit.	0: The toner is below a specific amount. 1: The toner is above a specific amount.
SD-37	Shows if the black developing assembly is present or absent.	0: The black developing assembly is present. 1: The black developing assembly is absent.
SD-38	Shows the presence/absence of the CD unit.	0: The CD unit is present. 1: The CD unit is absent.
SD-39	Shows the presence/absence of toner inside the developing assembly.	0: The toner is below a specific amount. 1: The toner is above a specific amount.

Table 3-24

Address	Item	Display/Notation	
SD-40	Shows the size of the upper cassette.	Display Example 1 7 Size Code 0: Paper is absent. 1: Paper present.	Size code 0: B5R 1: B5/MINI 2: (U3) 3: A4/LTR 4: A4R/LTR-R 5: B4/LGL 6: (UI) 7: A3/LDGL
SD-41	Shows the size of the middle cassette.		
SD-42	Shows the size of the lower cassette.		
SD-43	Shows the presence/absence of manually fed paper (Q9).	0: Paper is absent.	1: Paper is present.
SD-44	Shows the presence/absence of paper in the fixing assembly (Q10).	0: Paper is absent.	1: Paper is present.
SD-45	Shows the presence/absence of paper in the delivery assembly (rear; Q3).	0: Paper is absent.	1: Paper is present.
SD-46	Shows the presence/absence of paper in the delivery assembly (front; Q4).	0: Paper is absent.	1: Paper is present.
SD-47	Shows the presence/absence of paper in the delivery/feeder assembly (Q3).	0: Paper is absent.	1: Paper is present.
SD-48	Shows the presence/absence of paper in the overlay delivery assembly (Q1, Q2, Q3).	0: Paper is absent.	1: Paper is present.
SD-49	Shows the presence/absence of paper in the two-sided copy pick-up unit (Q6).	0: Paper is absent.	1: Paper is present.
SD-50	Shows the presence/absence of paper on the holding tray (Q7).	0: Paper is absent.	1: Paper is present.
SD-51	Shows the presence/absence of paper in the two-sided copy delivery assembly (Q5).	0: Paper is absent.	1: Paper is present.
SD-52	Shows the presence/absence of paper in the delivery assembly (Q11).	0: Paper is absent.	1: Paper is present.
SD-53	Shows the presence/absence of paper in the delivery assembly (center; Q14).	0: Paper is absent.	1: Paper is present.
SD-61	Shows the position of the scanner (Q1).	0: The scanner is not at the home position.	1: The scanner is at the home position.
SD-62	Shows the position of the lens (Q8).	0: The lens is not at the home position.	1: The lens is at the home position.
SD-63	Shows the position of the holding tray guide plate (Q4).	0: The guide plate is not at the home position.	1: The guide plate is at the home position.
SD-64	Shows the condition of the front doors and delivery assembly door.	0: The door is open.	1: The door is closed.
SD-65	Shows the condition of the rear cover (SW2).	0: The rear cover is attached.	1: The rear cover is detached.
SD-66	Shows the presence/absence of a control counter in the copier.	0: The counter is present.	1: The counter is absent.

Table 3-25

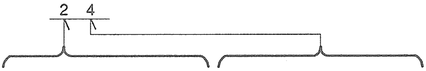
<table>
<tr><th>Address</th><th>Item</th><th colspan="10">Display/Notation</th></tr>
<tr><td>SD-67</td><td>Shows the length of the cleaning belt (Q6).</td><td colspan="5">0: The belt is shorter than a specific length.</td><td colspan="5">1: The belt is longer than a specific length.</td></tr>
<tr><td>SD-68</td><td>Shows the presence/absence of the cleaning belt (Q5).</td><td colspan="5">0: The belt is present.</td><td colspan="5">1: The belt is absent.</td></tr>
<tr><td></td><td></td><td colspan="10">Display Example
 </td></tr>
<tr><td></td><td></td><td></td><td>8</td><td>4</td><td>2</td><td>1</td><td>8</td><td>4</td><td>2</td><td>1</td><td>NO.</td></tr>
<tr><td>SD-70</td><td>Checks the ON/OFF of the control key.</td><td></td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td><td rowspan="6">Key</td></tr>
<tr><td>SD-71</td><td>Checks the ON/OFF of the control key.</td><td></td><td>M4</td><td>M3</td><td>M2</td><td>M1</td><td>C/S</td><td>*</td><td>9</td><td>8</td></tr>
<tr><td>SD-72</td><td>Checks the ON/OFF of the control key.</td><td></td><td>Darker</td><td>Lighter</td><td>AE</td><td>cassette</td><td>DIRECT</td><td>Copy</td><td>R</td><td>Preheat</td></tr>
<tr><td>SD-73</td><td>Checks the ON/OFF of the control key.</td><td></td><td>Consecutive mode setting</td><td>Consecutive mode set</td><td>Original frame erasing</td><td>REDUCE</td><td>ENLARGE</td><td>Zoom down</td><td>Zoom up</td><td>Auto repro</td></tr>
<tr><td>SD-74</td><td>Checks the ON/OFF of the control key.</td><td></td><td></td><td>Sheet frame erasing</td><td>Page separation</td><td>Cover mode</td><td>Binding</td><td>Overlay</td><td>Photo</td><td>Two-sided</td></tr>
<tr><td>SD-75</td><td>Checks the ON/OFF of the control key.</td><td></td><td></td><td></td><td></td><td></td><td></td><td>Interrupt</td><td>Sort</td><td></td></tr>
<tr><td>SD-77</td><td>Shows the setting of the pre-transfer current.</td><td colspan="10"></td></tr>
<tr><td>SD-78</td><td>Shows the setting of the transfer current.</td><td colspan="10"></td></tr>
<tr><td>SD-79</td><td>Shows the setting of the separation current.</td><td colspan="10"></td></tr>
<tr><td>SD-80</td><td>Shows the setting of VR606.</td><td colspan="10">Use it to adjust the optimum exposure; 000 to 225.</td></tr>
<tr><td>SD-81</td><td>Shows the setting of VR601.</td><td colspan="10">Use it to adjust the optimum exposure during AE; 000 to 255.</td></tr>
<tr><td>SD-82</td><td>Reserved.</td><td colspan="10"></td></tr>
<tr><td>SD-85</td><td>Shows the nature of error in the RDF.</td><td colspan="10">See Table 3-28.</td></tr>
<tr><td>SD-86</td><td>Shows the nature of original placement in the RDF.</td><td colspan="10">See Table 3-29.</td></tr>
<tr><td>SD-87</td><td>Shows the nature of error in the sorter.</td><td colspan="10">See Table 3-30.</td></tr>
<tr><td>SD-88</td><td>For Factory use.</td><td colspan="10"></td></tr>
<tr><td>SD-90</td><td>Level of the original sensor.</td><td colspan="10" rowspan="5">Use it to check the level of each sensor in the RDF.</td></tr>
<tr><td>SD-91</td><td>Level of the original edge sensor.</td></tr>
<tr><td>SD-92</td><td>Level of the skew sensor.</td></tr>
<tr><td>SD-93</td><td>Level of the pick-up sensor.</td></tr>
<tr><td>SD-94</td><td>Level of the belt motor thermister.</td></tr>
</table>

Table 3-26

No.	Type of jam
01	Forced removal; at pick-up from PDF
02	Delay; RDF pick-up sensor
03	Delay; registration/skew sensor
04	Skew; registration/skew sensor
05	Stationary; registration/skew sensor
06	Double feeding; registration/skew sensor
07	Skew; registration/skew sensor
09	Bending; registration/skew sensor
11	Delay 1; reversal sensor
12	Stationary; reversal sensor
13	Delay; 2 reversal sensor
20	Stationary, initial; reversal sensor
21	Delay, at reversal/ pick-up; registration/skew
22	Bending, at reversals; registration/ skew sensor
23	Stationary, at reversal, pick-up; registration/skew sensor
24	Skew, after reversal; registration/ skew sensor
26	Bending, reversal/pick-up; registration pick-up sensor
41	Delay; delivery sensor
42	Stationary; delivery sensor
51	Delay; delivery in high-speed copy mode
52	Stationary; delivery in high-speed copy mode
81	RF open
82	Pick-up tray or upper cover open
83	Absence of delivery original; original sensor
84	Presence of original; at pick-up
85	Jams unique to test mode
86	Displaced tray guide for delivery; guide path narrower than original
87	Double feeding; when sensor is activated
88	Presence of original, at first pick-up
89	Faulty recycle lever operation, at original circulation (2nd cycle and thereafter)
A1	Feeder cover open, at sub feeder pick-up
A2	Sub feeder cover open, at sub feeder feed
B1	Forced removal, at sub feeder pick-up
B2	Delay, pick-up, feed; sub registration sensor
B3	Bending; sub registration sensor
B4	Wrong original size; sub registration sensor
B5	Stationary, at pick-up, feed; sub registration sensor
C1	Delay, at delivery; sub registration sensor
C2	Stationary, at delivery; sub registration sensor
C3	Mixed original sizes in RDF, at delivery to right feeder cover
C4	Feeder cover open, at delivery to right feeder cover

Table 3-26 SD-17 (RDF Jams)

No.	Description
01	The stapling operation has failed.
02	A staple has jammed.
05	The stapler capacity has been exceeded.
06	The stapler capacity has been reached.
07	Originals of mixed sizes are present (horizontal).
09	Stapled copies are present in a bin.
0A	Staples are absent.

Table 3-27 SD-18 (sorter jam)

No.	Description
1	E401 ON signal
2	E402 ON signal
3	E403 ON signal
4	E404 ON signal
5	E405 ON signal
6	E406 ON signal
7	E407 ON signal
11	E411 ON signal
31	E431 ON signal

Table 3-28 SD85 (RDF)

No.	Description
1	The recycle lever has swung idly.
2	The original edge sensor has not detected an original.
3	Separation failed at time of pick-up.
4	The original has moved askew at time of pick-up.
5	The original has overriden the paper stopper plate at time of pick-up.
11	The number of originals changed after jam removal.
12	The number of originals is excessive.

The above are communicated by the RDF to the copier when the original is placed incorrectly.

Table 3-29 SD-86

No.	Description
0	E500 ON signal signal
10	E510 ON signal signal
13	E513 ON signal signal
30	E530 ON signal signal
31	E531 ON signal signal
40	E540 ON signal signal

Table 3-30 SD-87 (sorter jam)

E. I/O DISPLAY MODE (*2* ZOOM KEY)

Use the ZOOM keys to select the addresses.

① I/O Display

After checking the lens home position, reference to address PC-12 of Table 3-37 indicates that bit 5 corresponds to the lens home position signal.

Selecting address PC-12 causes the following to appear on the message display of the control panel.

```
PC-12            0000          0000

                 ↑↑↑↑          ↑↑↑↑
              bit7654          3210
```

Figure 3-104

Reference to Table 3-105 indicates that bit 5 corresponds to '0', which is the sixth from the right; when the machine is operated and lens home position sensor goes ON, the notation for bit 5 will change from '0' to '1'.

```
PC-12            0010          0000

                   ↑
                  bit5
```

Figure 3-105

Address	bit	Display	Signal/ Command	Jack No.	Remarks
PC-000 (input)	0	Oscillation signal 0 (input)	KSR0	J113-B5, J114-A3	
	1	Oscillation signal 1 (input)	KSR1	J113-A5, J114-A10	
	2	Oscillation signal 2 (input)	KSR2	J113-B4, J114-B7	
	3	Oscillation signal 3 (input)	KSR3	J112-B12, J113-A6, J114-A4	
	4	Oscillation signal 4 (input)	KSR4	J113-A8, J114-A5	
	5	Oscillation signal 5 (input)	KSR5	J105-2, J113-A7, J115-A4	
	6	Oscillation signal 6 (input)	KSR6	J104-3, J113-B7, J117-B15	
	7	Oscillation signal 7 (input)	KSR7	J113-B6, J117-B5	
	8	Delivery sensor (front) signal (Q4)	$\overline{\text{PDP2}}$	J103-B5	0: Paper is present.
	9	Two-sided copy pick-up paper sensor signal (Q6)	DPDP4	J112-B2	1: Paper is present.
	10	Delivery assembly paper sensor signal (Q11)	PDP3	J103-A9	1: Paper is present.
	11	Delivery/feed paper sensor signal (Q8)	DPDP1	J112-A13	1: Paper is present.
	12	Two-sided copy feed paper sensor signal (Q5)	DPEP2	J112-A2	1: Paper is present.
	13	Overlay copy delivery sensor signal (Q1, Q2, Q3)	$\overline{\text{DPDP3}}$	J112-B1	0: Paper is present.
	14	Delivery sensor (rear) signal (Q3)	$\overline{\text{PDP1}}$	J103-B9	0: Paper is present.
	15	Scanner home position signal (Q1)	SCHP	J103-A2	1: Scanner is present.
PC-001 (output)	0	Oscillation signal 0 (output)	SS0	J114-B2, J104-2	
	1	Oscillation signal 1 (output)	SS1	J114-A9	
	2	Oscillation signal 2 (output)	SS2	J114-B3	
	3	Oscillation signal 3 (output)	SS3	J112-B11, J114-A8	
	4	Oscillation signal 4 (output)	SS4	CP101-1	
	5	Oscillation signal 5 (output)	SS5	J113-B3	
	6	Fan drive command (FM4, 5, 9)	$\overline{\text{EFMD}}$	J117-B3	1: Fan goes ON.
	7	Fan speed switch command (FM4, 5, 9)	EFMD	J117-B4	0: Fan rotates at high speed.
	8	Paper reflector plate 1 solenoid drive command (DSL7)	$\overline{\text{DPSD1}}$	J112-A4	1: DSL7 goes ON.
	9	Paper stopper plate solenoid drive command (DSL10)	$\overline{\text{PSS}}$	J112-B6	1: DSL10 goes ON.
	10	Total copy counter drive command	$\overline{\text{TCND}}$	J110-5 J110-7	0: Counter goes ON.
	11	Small copy counter drive command	$\overline{\text{SCND}}$	J110-6	0: Counter goes ON.
	12	Reserved.		J114-A2	
	13	Paper deck lifter ready signal	$\overline{\text{LIDE}}$	J114-B6	1: Lifter is ready.
	14	Waste toner feed motor drive command (MB)	$\overline{\text{WTFM}}$	J110-10	1: Motor goes ON.
	15	Watch dog pulse	—	—	

Table 3-31

Address	bit	Display	Signal/ Command	Jack No.	Remarks
PC-002 (output)	0	Upper cassette pick-up clutch drive command (CL1)	UPUCD	J115-B1	0: CL1 ON
	1	Lower cassette pick-up clutch drive command (CL2)	LPUCD	J115-B2	0: CL2 ON
	2	Paper deck pick-up clutch drive command (CL2)	$\overline{\text{PUCD}}$	J114-B4	1: PCL1 ON
	3	Two-sided copy feed clutch drive command (DCL1)	$\overline{\text{DPUCD}}$	J112-B4	1: DCL1 ON
	4	Paper deck feed clutch drive command (PCL2)	$\overline{\text{FCD}}$	J114-A1	1: PCL2 ON
	5	Two-sided copy feed clutch drive command (DCL2)	$\overline{\text{DRGCD}}$	J112-B5	1: DCL2 ON
	6	Paper deck brake clutch drive command (PCL3)	$\overline{\text{BKCD}}$	J114-B1	1: PCL3 ON
	7	Manual feed pick-up clutch drive signal (CL1)	$\overline{\text{MPUCD}}$	J115-B3	0: CL ON
	8	Manual feed pick-up solenoid drive command (SL1)	$\overline{\text{MPUSD1}}$	J115-B5	0: SL1 ON
	9	Manual feed pick-up gate solenoid drive signal (SL2)	$\overline{\text{MPUSD2}}$	J115-B5	0: SL2 ON
	10	Pick-up roller guide solenoid drive command (DSL6)	DPISD	J112-B8	1: DSL6 ON
	11	Pick-up roller release solenoid drive command (DSL9)	DPRSD	J112-B7	0: DSL9 ON
	12		—	J111-B8	
	13	Paper reflector plate L solenoid drive command (DSL1)	DPSDL	J112-A3	0: DSL1 ON
	14	Paper reflector plate M solenoid drive command (DSL2)	DPSDM	J112-A1	0: DSL2 ON
	15	Paper deflector plate S solenoid drive command (DSL3)	DPSDS	J112-A6	0: DSL3 ON
PC-003 (input)	0	Manual feed paper sensor signal (Q9)	$\overline{\text{MPD}}$	J115-B4	0: Paper is present.
	1	Holding tray paper sensor signal (Q7)	TPDP	J112-A12	1: Paper is present.
	2	Reserved.		J111-B5 J105-5 J112-A10	
	3	Developing assembly set signal.	DVST	J103-A4	1: Developing assembly is present.
	4	Reserved.	—	J103-A5	
	5	Developing assembly toner supply command.	TSP	J103-A3	1: Toner is absent.
	6	Hopper unit toner absent signal (Q7)	TEP	J103-B1	1: Toner is absent.
	7	Waste toner feed motor overload signal	WMOL	J110-11	1: Motor is in error.
	8	Cleaning belt length sensor signal (Q6)	$\overline{\text{CBOP}}$	J103-B7	0: Belt is shorter than specified length.
	9	Cleaning belt out sensor signal (Q5)	CBOUT	J103-B8	0: Cleaning belt has run out.
	10	Manual feed selection sensor signal (MSJ)	MFS	J104-4	1: Manual is selected.
	11	Control signal for potential control	BUSY 1	J106-A9	
	12	Control signal for potential control	BUSY0	J106-A8	
	13	For communication with control panel	—	J116-B13	
	14	For communication with control panel	—	J116-A3	
	15	Reserved.	—	—	

Table 3-32

Address	bit	Display	Signal/ Command	Jack No.	Remarks
PC-004 (output)	0	Control panel control signal (output)	—	J116-B6	
	1	Control panel control signal (output)	—	J116-B7	
	2	Control panel control signal (output)	—	J116-B8	
	3	Control panel control signal (output)	—	J116-B9	
	4	Control panel control signal (output)	—	J116-B10	
	5	Control panel control signal (output)	—	J116-B11	
	6	Control panel control signal (output)	—	J116-B12	
	7	Control panel control signal (output)	—	J116-B13	
	8	Control panel control signal (output)	—	J116-B1	
	9	Control panel control signal (output)	—	J116-B2	
	10	Control panel control signal (output)	—	J116-B3	
	11	Control panel control signal (output)	—	—	
	12	Control panel lamp ON signal (output)	—	J116-B5	
	13		—	J116-B-14	
	14	Main motor speed control signal 0	MMSC0	J111-B6 J112-B10	
	15	Main motor speed control signal 1	MMSC1	J111-A7 J112-B9	
PC-005 (output)	0	Control panel control signal (output)	—	J116-A1	
	1	Control panel control signal (output)	—	J116-A2	
	2	Control panel control signal (output)	—	J116-A6	
	3	Control panel control signal (output)	—	J116-A7	
	4	Control panel control signal (output)	—	J116-A5	
	5	Control panel control signal (output)	—	J116-A4	
	6	Control panel control signal (output)	—	J116-A9	
	7	Paper auxiliary feed solenoid drive command (DSL4)	$\overline{\text{PAFSD}}$	J112-A14	0:DSL4 ON
	8	Primary corona current ON command	$\overline{\text{HVTP}}$	J106-B3	0: ON
	9	Pre-transfer corona current ON command	$\overline{\text{AC ON}}$ $\overline{\text{HVPON}}$	J107-5 J106-B5	0: ON
	10	Separation corona current ON command	$\overline{\text{HVSON}}$	J106-B5	0: ON
	11	Transfer corona current ON command	$\overline{\text{HVTT}}$	J106-B2	0: ON
	12	Roller electrode bias ON signal	$\overline{\text{ROED}}$	J106-B6	0: ON
	13	AC bias timing signal	$\overline{\text{ACBTP}}$	J106-B1	0: ON
	14	Lamp regulator ON command	$\overline{\text{LRD}}$	J104-7	1: Scanning lamp goes ON.
	15	Pre-exposure lamp ON signal	$\overline{\text{PEXP}}$	J103-B3	0: Pre-exposure lamp goes ON.

Table 3-33

Address	bit	Display	Signal/ Command	Jack No.	Remarks
PC-006 (input)	0	For communication with Q 158	–	–	
	1	For communication with Q 158	–	–	
	2	For communication with Q 158	–	–	
	3	For communication with Q 158	–	–	
	4	Delivery sensor (center) signal (Q14)	PDP5	J103-B11	1 : Paper is present.
	5	RR ready signal		J117-B14	
	6	For checks on power switch ON (24V)	–	–	0 : 24V ON
	7	CCV connect signal	CCNNT	J117-A11	1 : CCV is connected.
(output	8	Cleaning belt motor drive pulse 1	$\overline{\text{WMDP1}}$	J111-A4	
	9	Cleaning belt motor drive pulse 2	$\overline{\text{WMDP2}}$	J111-A3	
	10	Cleaning belt motor drive command	$\overline{\text{WMD}}$	J111-A1	1: Motor goes ON.
	11	Hopper motor drive pulse 1	$\overline{\text{HMDP1}}$	J111-B3	
	12	Hopper motor drive pulse 2	$\overline{\text{HMDP2}}$	J111-A2	
	13	Hopper motor drive command	$\overline{\text{HMD}}$	J111-B2	1: Motor goes ON.
	14	Scanner cooling fan 2 drive command (FM8)	IFMD2	J115-A7	0 : Fan goes ON.
	15	Fixing assembly drive stop command (SL4)	$\overline{\text{FRS}}$	J115-A2	0 : SL4 goes ON.
PC-007	0	For communication with Q158	–	–	
	1	For communication with Q158	–	–	
	2	For communication with Q158	–	–	
	3	For communication with Q158	–	–	
	4	For communication with Q158	–	–	
	5	For communication with Q158	–	–	
	6	Paper hold solenoid drive command (DSL8)	$\overline{\text{DPSD2}}$	J112-B13	1: DSL8 goes ON.
	7	Scanner forward command	$\overline{\text{SCFW}}$	J105-11	1: Scanner moves forward.
(output)	8	Scanner motor drive command	SCMD	J105-12	1 : Scanner motor goes ON.
	9	Scanner motor stop command	SCST	J105-13	0 : Scanner motor stops.
	10	Scanner speed control signal	SCSC	J105-14	
	11	Reproduction ratio signal 1	SCRC1	J105-10	
	12	Reproduction ratio signal 2	SCRC2	J105-9	
	13	Corona wire cleaning forward command	TCLMD PCLMD	J111-A8 J113-B1	0 : Motor goes ON.
	14	Corona wire cleaner forward command	TCLMF PCLMF	J111-B7 J113-A2	0 : Cleaner moves forward.
	15	Control signal	–	–	

Table 3-34

Address	bit	Display	Signal/ Command	Jack No.	Remarks
PC-008 (output)	0	Data BO signal for potential control	DB0	J106-A1	
	1	Data B1 signal for potential control	DB1	J106-A2	
	2	Data B2 signal for potential control	DB2	J106-A3	
	3	Data B3 signal for potential control	DB3	J106-A4	
	4	Control signal 0 for potential control	CTL0	J106-A5	
	5	Control signal 1 for potential control	CTL1	J106-A6	
	6	Reset signal for potential control	RESET	J106-A7	
	7	LED101 ON command	–	–	
	8	Pre-exposure lamp intensity switch signal	x 0.7	J114-A7	1: Low intensity (reproduction 89 % or lower)
	9	PU1 power supply PCB remote signal	REMOTE	J105-8	1: PU1 ON.
	10	Developing clutch drive command (CL5)	DVLD	J117-B1	0: CL5 ON.
	11	Two-sided copy motor drive signal command (DM1)	BSMD	J112-A11	0: DM1 ON.
	12	Scanner cooling fan 1 drive signal (FM3)	IFMD1	J113-B10	0: Fan goes ON.
	13	Reserved.			
	14	Control panel power supply indication ON signal	–	J117-A10	1: OFF.
	15	Power supply PCB cooling fan drive signal (FM6)	$\overline{\text{FM6 ON}}$	J116-A11	0: Fan goes ON.
PC-010 (output)	0	For communication with Q101	–	–	
	1	For communication with Q101	–	–	
	2	For communication with Q101	–	–	
	3	For communication with Q101	–	–	
	4	For communication with Q101	–	–	
	5	Feed fan drive command FM2	FFMD	J117-B2	0: Fan goes ON.
	6	Q158 control signal	–	–	
	7	Belt feed solenoid drive signal (DSL5)	$\overline{\text{BDSD}}$	J112-A5	0: Solenoid goes ON.
PC-011 (output)	0	Lens motor drive pulse 1	LMDP1	J111-A5	
	1	Lens motor drive pulse 2	LMDP2	J111-A4	
	2	Holding tray motor drive pulse1	TMDP1	J112-A7	
	3	Holding tray motor drive pulse 2	TMDP2	J112-A8	
	4	Lens motor retain command	$\overline{\text{LMH}}$	J111-B1	0: Motor goes ON.
	5	Tray motor retain command	$\overline{\text{TMH}}$	J112-A9	0: Motor goes ON.
	6	Main heater drive command (H3)	$\overline{\text{HTRD}}$	J102-3	0: Heater goes ON.
	7	Sub heater drive signal (H2)	$\overline{\text{SHD}}$	J102-4	0: Heater goes ON.

Table 3-34

Address	bit	Display	Signal/ Command	Jack No.	Remarks
PC-012 (input)	0	Reserved.	–	J102-5	
	1	Reserved.	–	J102-7	
	2	Reserved.	–	J102-1	
	3	Clock signal	–	–	
	4	Watch dog	–	–	
	5	Lens home position sensor signal (Q8)	LHP	J103-A7	1 : Lens is at home position.
	6	Holding tray home position sensor signal (Q4)	THP	J112-B3	1 : Tray is at home position.
	7	Intensity control signal	LINT	J104-9	
PC-013 (output)	0	Blank exposure lamp ON control signal	SGM0	J101-5	
	1	Blank exposure lamp ON control signal	SGM1	J101-6	
	2	Blank exposure lamp ON control signal	SGM2	J101-7	
	3	Blank exposure lamp ON control signal	SGM3	J101-8	
	4	Blank exposure lamp ON control signal	SGM4	J101-9	
	5	Blank exposure lamp ON control signal	SGM5	J101-10	
	6	Blank exposure lamp ON control signal	SGM6	J101-11	
	7	Blank exposure lamp ON control signal	SGM7	J101-12	
PC-014 (output)	0	Blank exposure lamp ON control signal	DSP0	J101-4	
	1	Blank exposure lamp ON control signal	DSP1	J101-3	
	2	Blank exposure lamp ON control signal	DSP2	J101-2	
	3	Blank exposure lamp ON control signal	DSP3	J101-1	
	4	For communication with Q101	–	–	
	5	For communication with Q101	–	–	
	6	For communication with Q101	–	–	
	7	For communication with Q101	–	–	
PC-020		Surface potential measurement	POT	J106-A10	
PC-021		For checks on 24V power supply on PU1	–	–	
PC-022		For checks on 24V power supply on PU2	–	–	
PC-023		For checks on setting of VR 606	–	J113-B2	
PC-024		For checks on setting of VR 601	–	J113-A3	
PC-025		Measurement (TH2) of scanner motor thermistor	–	J113-A4	

Table 3-34

2. RF

Address	bit	Display	Signal/ Command	Jack No.	Remarks
PC-40 (output)	0	Side guide motor pulse signal	SGA	J14-5	
	1	Side guide motor pulse signal	SGA	J14-4	
	2	Side guide motor pulse signal	SGB	J14-3	
	3	Side guide motor pulse signal	SGB	J14-2	
	4	Side guide motor drive command	–	J14-1	1: Motor goes ON.
	5	Recycle motor drive command	$\overline{\text{RMD}}$	J12-3	1: Motor goes ON.
	6	Pick-up motor drive command	PUMD	J10-7	1: Motor goes ON.
	7	AE sensor lamp ON command	–	J16-1	0: Lamp goes ON.
PC-41 (input)	0	Skew sensor signal	PDP4	J11-23	1: Original is present.
	1	Belt motor clock signal	BMCLK	J11-17	
	2	Feed motor clock signal	FMCLK	J11-15	
	3	Belt motor double clock signal	–	–	
	4	Delivery motor clock signal	DMCLK	J9-2	
	5	Pick-up motor clock	PMCLK	J10-11	
	6				
	7	Q8 communciation signal	–	–	
PC-42	0	For communication with sub feeder controller PCB	–	J5-4	
	1	For communication with sub feeder controller PCB	–	J5-3	
	2	Q8 communciation signal	–	–	
	3	Q8 communciation signal	–	–	
	4	Belt motor drive command	BMD	–	1: Motor goes ON.
	5	Belt motor CW/CCW drive command	BMS	–	0: Motor rotates counterclockwise.
	6	Feed motor drive command	FMD	J8-3	1: Motor goes ON.
	7	Delivery motor drive signal	DMD	J4-1	1: Motor goes ON.
PC-43	0	Watchdog signal	–	–	
	1	LED1 ON command	–	–	0: LED ON
	2	Paper deflector solenoid drive command	$\overline{\text{DFSLD}}$	J8-6	1: Solenoid goes ON.
	3	RDF ready signal	RDY	J1-6	0: RDF is ready.
	4	Q4 communication signal	–	–	
	5	Q4 communication signal	–	–	
	6	Q18 communication signal	–	–	
	7	Belt motor thermistor signal	TH	J11-19	

Table 3-37

Address	bit	Display	Signal/ Command	Jack No.	Remarks
PC-44	0	Reserved.			
	1	Pick-up roller sensor signal	$\overline{\text{PUSP}}$	J11-7	0: Roller is at home position.
	2	Pick-up sensor signal	PDP1	J11-11	1: Original is present.
	3	Delivery sensor signal	PDP2	J11-9	1: Original is present.
	4	Reversal sensor signal	PDP5	J11-13	1: Original is present.
	5	Delivery/feed sensor signal	PDP6	J9-7	1: Original is present.
	6	Delivery intermediate signal	PDP7	J9-10	1: Original is present.
	7	Push switch (SW1) signal	–	–	1: SW1 ON
PC-45	0	DIP switch signal 1	–	–	0: SW ON
	1	DIP SW1 signal 2	–	–	0: SW ON
	2	DIP SW1 signal 3	–	–	0: SW ON
	3	DIP SW1 signal 4	–	–	0: SW ON
	4	DIP SW1 signal 5	–	–	0: SW ON
	5	DIP SW1 signal 6	–	–	0: SW ON
	6	RDF switch signal	$\overline{\text{RFC}}$	J2-1	0: RDF is open.
	7	Upper cover switch signal	$\overline{\text{UPCC}}$	J3-1	0: Upper cover is open.

Table 3-38

Address	bit	Display	Signal/ Command	Jack No.	Remarks
PC-46	0	Original tray motor overload signal	$\overline{\text{TMOL}}$	–	0: Overcurrent is present.
	1	Original tray position sensor signal	DTLP	J15-4	0: Original tray is lowering.
	2	Mix mode switch signal	$\overline{\text{SMM}}$	J12-14	0: Switch is ON.
	3	Thick mode switch signal	$\overline{\text{TDM}}$	J12-15	0: Switch is ON.
	4	Reserved.		J9-5	
	5	Auxiliary tray is open.	$\overline{\text{STC}}$	J12-11	1: Auxiliary tray is open.
	6	Recycle sensor signal	LDD	J12-4	1: Original is set.
	7	CCV connect signal	–	J5-6	0: CCV is present.
PC-47	0	Mix mode LED ON signal	$\overline{\text{SMLED}}$	J12-16	1: LED ON
	1	Thick mode LED ON signal	$\overline{\text{TDLED}}$	J12-17	1: LED ON
	2	Original set LED ON signal	$\overline{\text{DSD1}}$	J12-1	1: LED ON
	3	For Q8 communication	–	–	
	4	Paper holder plate solenoid drive signal	$\overline{\text{WSLD}}$	J10-4	1: Solenoid goes ON.
	5	Belt motor brake command	–	–	
	6	Feed motor brake command	–	–	
	7	Delivery motor brake command	–	–	
PC-48	0	Stopper plate solenoid drive command	$\overline{\text{STPSLD}}$	J10-2	1: Solenoid goes ON.
	1	Registration solenoid drive command	$\overline{\text{RG SLD}}$	J8-2	1: Solenoid goes ON.
	2	Brake solenoid drive signal	$\overline{\text{BKD}}$	J13-2	1: Solenoid goes ON.
	3	Original setter solenoid drive command	$\overline{\text{DSSLD}}$	J12-6	1: Solenoid goes ON.
	4	For Q18 communication	–	–	
	5	Feed synch clutch drive command	$\overline{\text{CLD1}}$	J10-6	1: Clutch goes ON.
	6	Original tray motor drive command	TMD	J15-2	1: Motor goes ON.
	7	Delivery deflector plate solenoid drive signal	$\overline{\text{DDF SLD}}$	J17-20	1: Solenoid goes ON.

Table 3-39

3. Sorter

Address	bit	Display	Signal/ Command	Jack No.	Remarks
PC-50	0	Reserved.			
	1	Stapling home position (PI12) signal	SPL-HP	J11-3	1: Stapling is at home position.
	2	Stapler unit swing sensor (MS9) signal	SWG SET	J8-5	1: Stapler unit is at home position or stapling position.
	3	Stapler cover open/closed sensor (MS5) signal	SPLOPN	J10-3	1: Stapler cover is open.
	4	Guide bar home position sensor (PI7)	SGBHP	J12-6	1: Bar is at home position.
	5	Lead cam home position sensor (PI5) signal	LCHP	J14-5	1: Cam is at home position.
	6	Reserved.			
	7	Reserved.			
PC-51	0	Guide cover swing motor (M3) phase A excitation signal	$\overline{\text{MA}}$	J13-3, 5	
	1	Guide cover swing motor (M3) phase B excitation signal	$\overline{\text{MB}}$	JB-4, 6	Alternates between '1' and '0' while motor is ON.
	2	Guide bar swing motor (M3) drive command	MON	J13-2	1: Motor goes ON.
	3	Staple motor (M4) CW rotation command	$\overline{\text{SPLMFW}}$	–	0: Motor rotates clockwise.
	4	Staple motor (M4) CCW Rotation command	$\overline{\text{SPLMRV}}$	–	0: Motor rotates CCW.
	5	Switch-back path solenoid (SL1) drive command	$\overline{\text{SBPSLD}}$	J7-10	0: SL1 goes ON.
	6	Paper path switch solenoid (SL2) drive command	$\overline{\text{PSLD}}$	J7-8	0: SL2 ON
	7	Paper path switch solenoid (SL3) drive command	$\overline{\text{PHSLD}}$	J5-2	0: SL3 ON
PC-52	0	Motor switch signal	–	–	
	1	Stapling ready display ON signal	SPLOK	J8-4	1: LED ON
	2	Bin inside paper sensor LED ON signal	$\overline{\text{BPD}}$	J12-2	
	3	Motor clock signal	–	–	
	4	Stapler unit swing motor (M5) drive command	$\overline{\text{SWGMD}}$	J9-1	1: M5 ON
	5	Feed motor clock sensor (P16) signal	FMCLK	J5-4	
	6	Reserved.	–	–	
	7	Feed motor (M1) brake signal	–	–	1: M1 goes OFF.

Table 3-40

Address	bit	Display	Signal/ Command	Jack No.	Remarks
PC-53	0	Stapling position paper sensor signal	SPD	J8-8	1: Paper is present.
	1	Reserved.	—	—	
	2	Manual staple key signal	MNSPL	J8-1	0: Switch is ON.
	3	Non-sort paper sensor signal	$\overline{\text{NSPEXT}}$	J7-5	0: Paper is present.
	4	Sort paper sensor signal	$\overline{\text{SPEXT}}$	J7-2	0: Paper is present.
	5	Bin unit home position sensor signal	BHP	J14-2	1: Bin unit is at home position.
	6	Joint sensor signal	$\overline{\text{SOP}}$	J2-2	0: Sorter is released.
	7	Reset signal	—	—	
PC-54	0	Stapling position set sensor signal	SPL-SET	J10-6	0: Stapler is at stapling position.
	1	Reserved.			
	2	Reserved.			
	3	Reserved.			
	4	Reserved.			
	5	Reserved.			
	6	Reserved.			
	7	Reserved.			

Table 3-41

F. VOLUME ADJUSTMENT MODE (*3*)

Use the ZOOM keys to select the addresses.

Use the input keypad or COPY DENSITY keys to set the settings for each address, and press the asterisk key at the end.

Address	Description	Settings	Remarks
SV-0	Reserved.		
SV-1	For factory use.	0~9	At time of shipment, '0'.
SV-2	Use it to adjust the sensitivity of the photosensitive drum.	0, 1, 2, 3, 4, 5, 6, 7	Enter the settings recorded on the settings sheet that comes with the photosensitive drum.
SV-3	Use it to adjust the force of pick-up from the upper cassette (arcing).	0~4	An increase in the setting causes the pick-up clutch to go ON earlier. 0: -9 clocks (-15.84 mm) 1: -3 clocks (-5.28 mm) 2: 0 3: +3 clocks (+5.28 mm) 4: +6 clocks (+10.56 mm)
SV-4	Use it to adjust the force of pick-up from the lower cassette (arcing).		
SV-5	Use it to adjust the pre-transfer current.	0~300	An increase in the setting increases the current from the pre-transfer corona assembly.
SV-6	Use it to adjust the transfer current.	0~300	An increase in the setting increases the current from the transfer corona assembly.
SV-7	Use it to adjust the separation current.	0~300	An increase in the setting increases the current from the separation corona assembly.
SV-8	Use it to adjust the registration.	-9.0~+9.0	An increase in the setting increases the margin in 0.1mm increment.
SV-9	Use it to adjust the scanner start timing; when RDF is in use.	0~4	Use it if the leading edge of the image is blurred when the RDF is in use; an increase in the setting causes the scanner to start later. (at shipment, set to '2')

Table 3-45

Address	Description	Settings	Remarks
SV-10	Use it to adjust the arcing in the paper deck.	0~4	An increase in the setting causes the feed clutch of the paper deck to go ON earlier. 0:-6 clocks (-10.56 mm) 1:-3 clocks (--5.28 mm) 2:0 3:+3 clocks (+5.28 mm) 4:+6 clocks (+10.56 mm)
SV-11	Use it to adjust the arcing in the duplexing unit; not applicable to A3*. *Use SV-17	0~6	An increase in the setting causes the two-sided copy feed clutch in the duplexing unit to go ON earlier. 0:-9 clocks (-15.84 mm) 1:-6 clocks (-5.28 mm) 3:0 4:+3 clocks (+5.28 mm) 5:+6 clocks (+10.56 mm) 6:+9 clocks (+15.84 mm) 7: +12 clocks (+21.12 mm) 8: +15 clocks (+26.4 mm) 9: +18 clocks (+31.68 mm)
SV-12	Use it to adjust the margin along the leading edge; i.e. blank exposure lamp ON time.	-14.5~+14.5 (mm)	An increase in the setting increases the margin along the leading edge of the copy (2nd page in binding or page separation mode). [Unit: 0.1 mm]
SV-13	Use it to adjust the margin along the trailing edge.	-52~+4.8 (mm)	Use it to adjust the margin along the trailing edge of the copies in the original frame or sheet frame erasing. [Unit: 0.1 mm]
SV-14	For factory use.		
SV-15	For factory use.		
SV-16	Use it to adjust the primary corona assembly leakage.	0~3	Increase the setting for copiers in highlands, where leakage from the primary corona assembly is frequent.
SV-17	Use it to adjust the looping (A3) in the duplexing unit.	0~6	An increase in the setting causes the two-sided copy feed clutch of the duplexing unit to go ON earlier. 0:-9 clocks (-15.84 mm) 1:-6 clocks (-10.56 mm) 2:-3 clocks (-5.28 mm) 3:0 4:+3 clocks (+5.28 mm) 5:+6 clocks (+10.56 mm) 6:+9 clocks (+15.84 mm) 7: +12 clocks (+21.12 mm) 8: +15 clocks (+26.4 mm) 9: +18 clocks (+31.68 mm)
SV-18	For factory use.		
SV-19	For factory use.		

Table 3-41

G. SWITCH MODE (* 4 *)

Use the ZOOM keys to select the addresses.

The operation under each item may be executed only in the standby mode or during copying operation. A press on the asterisk key during the wait mode causes the copier to go into the standby mode and then execute the selected operation.

Address	Description	Remarks
SS-0	Use it to feed toner at time of installation.	A press on the * key causes the hopper unit to supply the developing assembly with toner; 6 min. max.
SS-1	Use it to test the scanner motor.	A press on the * key causes the scanner to move forward and in reverse; repeated ten times.
SS-2	Use it to check the activation of the scanning lamp.	A press on the * key causes the hopper motor to rotate for 5 sec.
SS-3	Use it to check the operation of the hopper motor.	A press on the * key causes the hopper motor to rotate for 5 sec.
SS-4	Use it to check the activation of the blank exposure lamp.	A press on the * key causes the blank exposure lamp to go ON and remain ON for 5 sec.
SS-5	Use it to check the activation of the indicators on the control panel.	A press on the * key causes the indicators on the control panel to go ON and remain ON for 5 sec.
SS-6	Use it to check the operation of the lens motor.	A press on the * key causes the lens motor to rotate, thereby moving the lens to the 64%, 142%, and then 100% positions.
SS-7	Use it to check the operation of the holding tray motor.	Press the cassette selection key on the control panel to select the size of the copy paper; thereafter, a press on the key causes the holding tray to rotate, thereby moving the tray guide plate to the home position and then to the point corresponding to the selected size.
SS-8	Use it to clear the date stored in RAM (Q109, Q113) on the DC controller PCB for initialization.	Press 0 0 0 0 and * to initialize the RAM data.
SS-9	Use it to initialize the counter mode (* 6 *)	A press on the * key causes the counter reading
SS-10	Use it to cause the bins of the first sorter up.	Press the * key to move up thjje bins of the first sorter (to 21st)
SS-11	Reserved.	
SS-12	Use it to execute potential control.	See p.2-11; use it to adjust the VR for the primary corona assembly.
SS-13	Clear E000	To clear E000, switch the copier OFF and then ON; thereafter, select SS-13, and press the * key.

Table 3-41

H. SPECIFICATIONS SETTING MODE (⊛5⊛)

Use the ZOOM keys to select the addresses.

Address	Function	Description	Key operation
MS-0	Use it to set the time for the auto shut-off mechanism.	The auto shut-off time may be set between 10 min and 480 min in 10-min increment; if set to 0 min, the mechanism will be disabled.	To set it to 180 min, enter '18', and then press the ⊛key.
MS-1	Use it to select the sort/non-sort mode.	It enables selection between sort and non-sort mode in response to a press on the reset key. 0: Non-sort mode. 1: Sort mode. 2: A press on the reset key will not change the indication; the condition before the press will remain.	To select the sort mode, enter '1', and then press the ⊛key.
MS-2	Use it to select AE priority.	It enables selection or de-selection of the AE mode in response to a press on the reset key. 0: Non-AE mode. 1: AE mode. 2: A press on the reset key will not change the indication; the condition before the press will remain.	To de-select the AE mode, enter '0', and then press the ⊛key.
MS-3	Use it to select auto paper/auto reproduction ratio priority.	It enables selection or de-selection of the auto paper (APS) or auto reproduction (AMS) priority in response to a press on the reset key. 0: Non-APS and non-AMS. 1: APS. 2: AMS. 3: A press on the reset key will not change the indication; the condition before the press will remain.	To select auto paper (APS) priority, enter '1', and then press the ⊛ key.

Table 3-50

Address	Function	Description	Key operation
MS-4	Use it to select the auto cassette change mechanism.	When selected, the mechanism enables an automatic switch-over of cassettes; i.e., if one cassette runs out of paper during continuous copying operation, another cassette will be selected to continue the operation. 0: Non-auto cassette change. 1: Auto casette change.	To de-select the auto cassette change mechanism, enter '0', and then press the⊠key.
MS-5	Use it to select the buzzer.	0: Buzzer not heard. 1: Buzzer heard.	To de-select the buzzer, enter '0', and then press the ⊠key.
MS-6	Use it to select the standard frame erasing mechanism.	When selected, a width of 2.5 mm along both edges of copies will be blanked out. 0: Frame erasing. 1: Non-frame erasing.	To de-select the frame erasing mechanism, enter '1', and then press the ⊠key. To set the selection, switch the copier OFF, and disconnect the power plug from the outlet; adjust the bland exposure lamp position at the same time.
MS-7	Use it to select the bin shift time (sorter).	The bin shift time may be changed to correct jamming between 1st and 2nd bins (21st and 22nd bins). 0: Normal. 1: The shift time will be 100 ms longer, limiting occurrence of jams.	If jamming is frequent, enter '1', and then press the ⊠key.
MS-8	Reserved.		
MS-9	Use it to select the trailing edge margin mechanism (two-sided copy).	When de-selected, the margin along the trailing edge of the first side of the copies in the two-sided copy mode wil not be created. 1: Trailing edge margin. 0: No trailing edge margin.	

Table 3-51

<table>
<tr><th>Address</th><th>Function</th><th>Description</th><th>Key operation</th></tr>
<tr><td>MS-10</td><td>Use it to change the notation of dates.</td><td>The mechanism changes how dates are displayed; for example, Feb. 28 may be expressed as follows:
0:2/28
1:2,28
2:28/2
3:FEB.28</td><td>To select 'FEB.28', enter '4', and then press the⧆ key.</td></tr>
<tr><td>MS-11</td><td>Use it to set the date and time.</td><td>Enter the date and time; dates and times are displayed in this mode only.</td><td>Use the⧆ key and input keypad.</td></tr>
<tr><td>MS-12</td><td>Use it to specify how the originals should be identified (RDF).</td><td>Use it to specify how the originals should be identified (RDF).
0: The size of the original will be identified by its length in the feed direction.
1: The size of the original will be identified by the length and width of the original.
2: The size of the original will be identified by its length in the feed direction; in addition, double feeding will be checked*.
3: The size of the original will be identified by the length and width of the original; in addition, double feeding will be checked*.</td><td>Enter any number '0' through '3', and then press the⧆key; it is set to '0' at time of shipment from the factory.
*When two originals are picked up during a single pick-up operation, they are identified as a jam.</td></tr>
<tr><td>MS-13</td><td>Use it to change the copying speed to accommodate different fixing temperatures.</td><td>Use it to change the copying speed to accommodate different fixing temperatures.
<table>
<tr><th rowspan="2"></th><th colspan="2">Low speed temperature (ambient)</th><th colspan="2">Stationary temperature (ambient)</th></tr>
<tr><th>less than 23 °C</th><th>23 °Cor more</th><th>28 °C or more</th><th>less than 28 °C</th></tr>
<tr><td>0</td><td>164 °C</td><td>158 °C</td><td>152°C</td><td>155°C</td></tr>
<tr><td>1</td><td>167°C</td><td>161°C</td><td>152°C</td><td>155°C</td></tr>
<tr><td>2</td><td>167°C</td><td>161°C</td><td>155°C</td><td>158°C</td></tr>
<tr><td>3</td><td>170°C</td><td>164°C</td><td>152°C</td><td>155°C</td></tr>
<tr><td>4</td><td>170°C</td><td>164°C</td><td>155°C</td><td>158°C</td></tr>
<tr><td>5</td><td>173°C</td><td>167°C</td><td>158°C</td><td>161°C</td></tr>
</table>
</td><td>Enter any number '0' through '5', and then press the⧆key; it is set to '0', at time of shipment from the factory.</td></tr>
</table>

Table 3-52

<table>
<tr><th>Address</th><th>Function</th><th>Description</th><th>Key operation</th></tr>
<tr><td>MS-14</td><td>Use it to select the feed length of the cleaning belt.</td><td>If the backs of copies become soiled because of dirt on the belt, switch the feed length.
<table>
<tr><td>0</td><td>Normal</td></tr>
<tr><td>1</td><td>50% increase</td></tr>
<tr><td>2</td><td>75% increase</td></tr>
<tr><td>3</td><td>100% increase</td></tr>
</table>
Increases, however, will shorten the life of the belt.</td><td>Enter any number '0' through '3', and then press the ⧆key; it is set to '0' at time of shipment from the factory.</td></tr>
<tr><td>MS-15</td><td>Use it to set the pre-transfer, transfer, and separation corona outputs.</td><td>It enables selection of a variable or fixed setting for the pre-transfer, transfer, and separation cornna outputs; a variable setting reflects the changing ambient temperature.
0: Output fixed.
1: Output varied.</td><td></td></tr>
<tr><td>MS-16</td><td>Use it to select the auto start mechanism for the consecutive mode.</td><td>When selected, the mechanism can prohibit automatic copying used in the consective mode.
0: Auto copy start
1: Non-auto copy start.</td><td></td></tr>
<tr><td>MS-17</td><td>Use it to select RFAE.</td><td>It enables selection or de-selection of RFAE.
0: RFAE (CPAE).
1: NON-RFAE.</td><td></td></tr>
<tr><td>MS-18</td><td>Use it to change the cassette notation.</td><td>It enables a switch-over between the normal 9-level notation and 17-level notation.
0: 9-level notation.
1: 17-level notation.</td><td></td></tr>
<tr><td>MS-19</td><td>Use it to change the cassette notation.</td><td>0: Japan
1: USA
2: UK
3: Canada/general
4: Holland
5: France</td><td></td></tr>
</table>

Table 3-48

I. COUNTER MODE (* 6 *)

Use the ZOOM keys to select the addresses.
Use SS-9 to return the counter reading to '0'.

Address	Description	Maximum notation	Remarks
SC-1	Shows the number of pick-ups from the upper cassette.	U 99999999	Returns to '00000000'after '99999999'.
SC-2	Shows the number of pick-ups from the middle cassette.	L 99999999	
SC-3	Shows the number of pick-ups from the lower cassette.	P 99999999	
SC-4	Shows the number of pick-ups from the duplexing unit.	D 99999999	
SC-5	Shows the number of pick-ups from the RDF.	F 99999999	
SC-6	Shows the number of pick-ups from the multifeeder.	M 99999999	
SC-7	Shows the number of pick-ups from the sub feeder.	S 99999999	

Table 3-49

J. APC VOLUME ADJUSTMENT MODE (⊛ 7 ⊛)

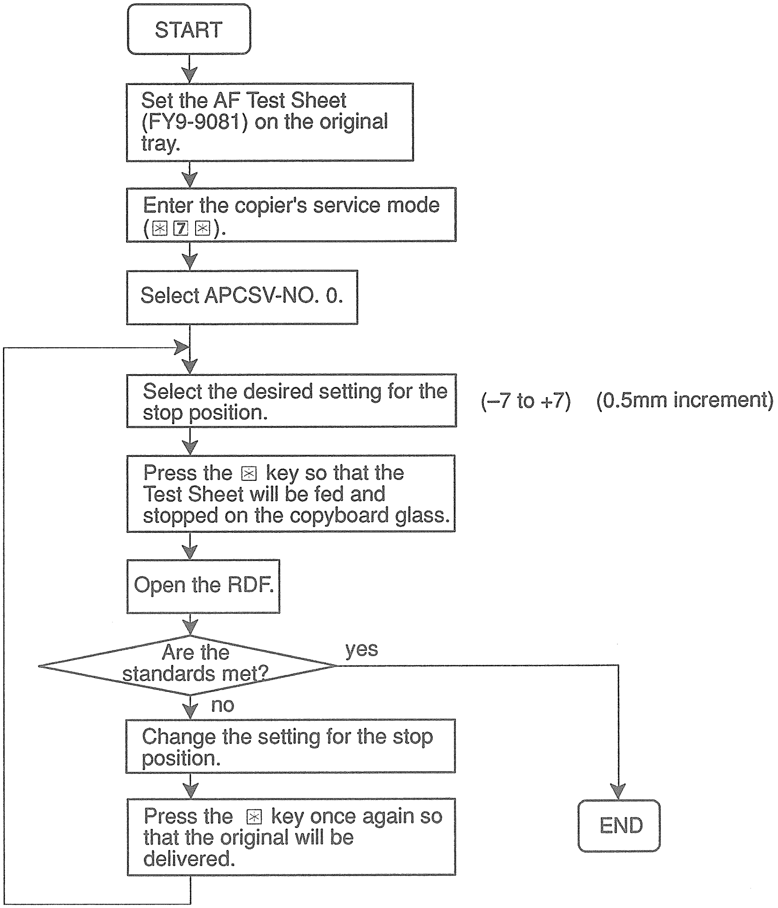
Use the ZOOM keys to select the addresses.

Use the input keypad or COPY DENSITY keys to select the settings for each address, and then press the asterisk key.

<table>
<tr><th>Address</th><th>Description</th><th>Settings</th><th>Remarks</th></tr>
<tr><td>APC-SV-0</td><td>Use it to adjust the RDF original stop position.</td><td>-7~+7</td><td>See P3-134</td></tr>
<tr><td>APC-SV-1</td><td>Use it to adjust the RDF skew degree.</td><td>—</td><td>See P3-135</td></tr>
<tr><td>APC-SV-2~6</td><td>Reserved.</td><td></td><td></td></tr>
<tr><td>APC-SV-7</td><td>DIP switch mode</td><td></td><td>
<table>
<tr><th>Settings</th><th>Test mode</th></tr>
<tr><td>1</td><td>Each press on the⊛key. causes operations in the RDF one-sided original mode to take place.</td></tr>
<tr><td>2</td><td>Causes the operations in the RDF one-sided continuous feed mode to take place.</td></tr>
<tr><td>5</td><td>Each press on the⊛key. causes operations in the RDF two-sided original interval mode to take place.</td></tr>
<tr><td>6</td><td>Causes operations in the RDF two-sided origianl continuous feed mode to take place.</td></tr>
<tr><td>10</td><td>Causes operations in the RDF right feeder cover continous delivery mode to take place.</td></tr>
<tr><td>18</td><td>Causes operations in the continuous feed mode to take place; from sub feeder to RDF.</td></tr>
<tr><td>26</td><td>Causes operations in the continuous feed mode to take place; from sub feeder to RDF and then to right feeder cover.</td></tr>
<tr><td>32</td><td>Cleans the separation assembly.</td></tr>
</table>
</td></tr>
</table>

Table 3-50

Ajusting the Original Stop Position


START
Set the AF Test Sheet (FY9-9081) on the original tray.
Enter the copier's service mode (⊠ 7 ⊠).
Select APCSV-NO. 0.
Select the desired setting for the stop position.
(−7 to +7) (0.5mm increment)
Press the ⊠ key so that the Test Sheet will be fed and stopped on the copyboard glass.
Open the RDF.
Are the standards met?
yes
no
Change the setting for the stop position.
Press the ⊠ key once again so that the original will be delivered.
END

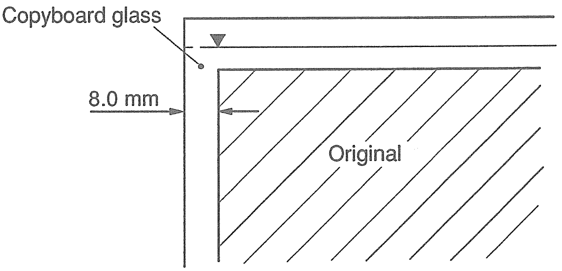

Copyboard glass
8.0 mm
Original

Figure 3-106

Skew Adjustment Mode

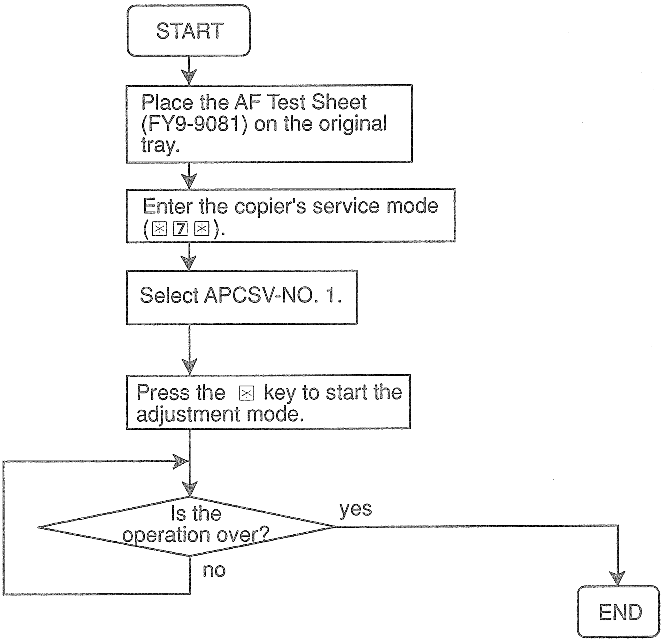

START
Place the AF Test Sheet (FY9-9081) on the original tray.
Enter the copier's service mode (⊠ 7 ⊠).
Select APCSV-NO. 1.
Press the ⊠ key to start the adjustment mode.
Is the operation over?
yes
no
END

Figure 3-107

K. ADJUSTMENT

Major PCBs are equipped with variable resistors (VR), which are adjusted at the factory.

Some of the VRs require high accuracy; as such, do not touch those not discussed herein in the field.

1. Using the Variable Resistors (VR)

a. VR601 (copier AE optimum image adjustment)

Turning VR601 adjusts the F5 optimum image for the AE mode.

Use the VR if the density differs between AE and manual modes during test copying operation.

b. VR606 (optimum exposure adjustment)

Turning VR606 adjusts the standard intensity of the scanning lamp, thereby varying the intensity during copying operation. Use the VR if the optimum position (5±1) of the COPY DENSITY key has a discrepancy.

c. VR on Primary Corona Assembly

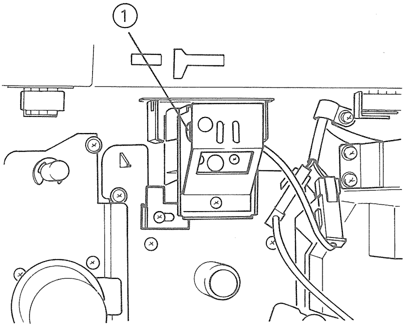
Turn the VR on the primary corona assembly for the following:

- When the primary corona assembly has been replaced; and
- When the VD reading under SD24 of the service mode (⧆ 1 ⧆) is not the target value (±30 V) with the corona current control mechanism (SW602) OFF.
- When the VD reading under SD24 of the service mode (⧆ 1 ⧆) is not the target value (±30 V) with the corona current control mechanism (SW602) ON.

① Using the VR

1) Connect the power plug to turn the heater ON; then, wait 10 minutes or more.
2) Turn the VR on the corona assembly fully counterclockwise to prevent excessive potential.
3) Turn SW602 on the switch/VR PCB OFF to turn the corona current control mechanism OFF.
4) Select SS-12 in the service mode (⧆ 4 ⧆)
5) Press the ⧆ key to execute potential control; effective only during standby.
6) Take note of the VD reading on the message display of the control panel.

7) Turn the VR on the primary corona assembly clockwise slightly if the VD reading is not ±30 V, and go to step 5); otherwise, go to step 8).



① VR

Figure 3-108

8) Turn SW602 ON to turn the corona current control mechanism ON.
9) Press the ⧆ key, and check that the VD reading after potential control is ±30; otherwise, go back to step 7).

IX. SELF DIGNOSIS

The copier is equipped with a self diagnostic mechanism that checks its condition, mainly by sensors. The mechanism makes checks as necessary, and if an error is identified, displays the fact on the message display in the form of codes.

A. COPIER SELF DIAGNOSIS

Code	Cause	Description
E000	. Thermistor (TH1; poor contact or open) . Fixing heater (H2, H3, open) . AC driver PCB (faulty) . DC controller PCB (faulty) . Relay (activation)	. The surface temperature of the fixing assembly upper roller fails to rise by a specified value within 90 sec after power-on. . The surface temperatue of the fixing assembly upper roller fails to reach 150 °C within 8 min after power-on. . The surface temperature of the fixing assembly upper roller fails to reach 180 °C within 5 min after it has reached 150 °C. . The surface temperature of the fixing assembly upper roller falls below 50 °C in standby.
E001	. Triac (faulty) . AC driver PCB (faulty) . DC controller PCB (faulty)	. The surface temperature of the fixing assembly upper roller exceeds 250 °C.
E005	. Cleaning belt (fixing assembly; taken up) . Cleaning belt sensor (Q5, Q6; faulty) . DC controller PCB (faulty)	. The cleaning belt inside the fixing assembly has been taken up more than a specified length.
E010	. Main motor (faulty) . Main motor driver PCB (faulty) . DC controller PCB (faulty)	. After generation of the main motor drive signal, two or more pulses are not received within 2 sec.
E013	. Waste toner feed motor (faulty) . Waste toner feed motor driver PCB (faulty) . DC controller PCB (faulty)	. The error detection circuit on the waste toner feed motor driver PCB has detected an overcurrent.

Code	Cause	Description
E020	. Toner level circuit (faulty) . Hopper unit (clogged outlet) . DC controller PCB (faulty)	. The accumulative time during which the toner supply signal (TSP) has been generated by the developing assembly reaches 3 min*.
E050	Duplexing unit . Holding tray home position sensor (faulty) . Duplexing unit holding tray motor (faulty) . Duplexing driver PCB (faulty) . DC controller PCB (faulty)	. The holding tray home position signal (THP) is not generated within 4 sec while the holding tray motor drive signal (TMDP1, 2) is being generated. . The holding tray home position signal (THP) is generated 1 sec or more while the holding tray motor drive signal (TMDP1, 2) is being generated.
E203	. Scanner motor (faulty) . Scanner motor driver PCB (faulty) . DC controller PCB (faulty)	. Input of two or more clock pulses is not received within 2 sec from the scanner motor when the scanner motor drive signal is generated.
E210	. Lens home position sensor (faulty) . Lens drive motor (faulty) . DC driver PCB (faulty) . DC controller PCB (faulty)	. The lens home position signal (LHP) is not generated within 4.8 sec after the power switch or door switch has gone ON. . The lens home position signal (LHP) is generate 2 sec or more.
E240	. DC controller PCB (faulty)	. An error has occurred in the microprocessor on the DC controller PCB.
E243	. Control panel controller PCB (faulty) . Connector (poor contact)	. An error has occurred in the communication between the microprocessor of the DC controller PCB and the microprocessor in the control panel.

Code	Cause	Description
E710	. DC controller PCB (faulty) . Connector (communication with option; poor contact)	. An error has occuured in the communication between the DC controller PCB and the controller PCB of the option, and the DC controller has detected the error.
No code; however, all indicators on the control panel except the copy count will go OFF.	. Scanner motor (faulty) . Scanner home position sensor (faulty) . Scanner motor driver PCB (faulty) . DC controller PCB (faulty)	. The scanner home position signal (SCHP) is not generated within about 10 sec after the scanner motor has gone ON.

* When the hopper unit has supplied the developing assembly with toner and, as a result, the toner supply signal (TSP) stops, the toner supply signal accumulated time stored in the microprocessor will be reset to '0'.

Note:

To reset the copier, switch it OFF and then ON. If the code is 'E000', however, switch the copier OFF and then ON; thereafter, select service mode SS-13, and press the ⊠ key. This is to prevent the user from resetting the copier without fixing a faulty thermistor, which could damage the rollers inside the fixing assembly.

B. RDF SELF DIAGNOSIS

Code	Cause	Description
E400	• Data communication (with copier; faulty)	• The communication is monitored at all times; the error is identified when the communication is absent for 5 sec or more.
E401	• Pick-up motor (M4; fails to rrotate) • Pick-up roller sensor (S3)	• The spindle of the pick-up motor (M4 is equipped with a flag which blocks the pick-up roller sensor (S3). the eror is identified when S3 does not go ON and OFF twice or more within 1 sec.
E402	• Belt motor (M3; fails to (rotate) • Belt motor clock sensor (S2)	• The number of belt clock pulses within 200 ms is below a specific value.
E403	• Feed motor (M5; fails to rotate) • Feed motor clock sensor (S5; faulty)_	• When the number of feed motor clock pulses within 200 ms is below a specific value.
E404	• Delivery motor (M2; fails to rotate) • Delivery motor clock sensor (S10; faulty)	• The number of delivery motor clock pulses within 200 ms is below a specific value.
E405	• Pick-up motor clock sensor (S1; faulty)	• The number of pick-up motor clock pulses within 200 ms is below a specific value.
E406	• Side guide motor (M7; fails to rotate) • Side guide motor driver (faulty)	• The setting of VR101 fails to be identical with that of VR102 within 5 sec after the side guide motor driver signal has been output; i.e., the guide has failed to complete its movement.

Code	Cause	Description
E407	• Original tray motor (M1; fails to rotate) • Original tray position sensor (S11; faulty)	• The original tray position sensor fails to go ON or OFF after the original tray motor drive signal has been output; i.e., the original tray has failed to complete its movement.
E411	• Original sensor (PTR3; faulty) • Registration sensor (PTR2; faulty) • Skew sensor (PTR1; faulty) • Original edge sensor (PTR4; faulty)	• The output of the sensor is 2.3 V or more when paper is absent.
E431	• Sub registration sensor (PTR51; faulty) • Sub original sensor (PTR52; faulty) • Sub feeder motor (M51; faulty)	• The output of the sensor is 2.3V or more when paper is absent. • The number of sub feeder motor clock pulses within 200 ms is below a specific value.

NOTE:

To set the machine, switch the copier OFF and then ON.

To make copies when the RDF is down, open the RDF, and set originals on the copyboard glass.

C. SORTER SELF DIAGNOSIS

Code	Cause	Description
E500	. The CPU (Q1) or communication IC (Q3) on the sorter controller fails to operate normally.	. An error occurs in the communication between the sorter and copier.
E510	. The feed motor (M1) fails to rotate.	. The clock signal from the motor remains OFF for 250 ms or more.
E513	. The Tandem Feed Unit motor (M6) fails to rotate.	. The clock signal from the motor remains OFF for 250 ms or more.
E530	. The staple guide bar swing motor (M3) fails to rotate.	. The home position sensor (P17) fails to go OFF after 2560 pulses of the motor drive signal have been generated.
E531	. The stapler unit swing motor (M5) fails to rotate.	. The stapler unit swing sensor (MS9) fails to go OFF within 500 ms after the motor drive signal has been generated. . The sensor fails to go ON within 1000 ms after MS9 has gone OFF.
E540	. The bins shift motor (M2) fails to rotate.	. The lead cam home position sensor (P12) fails to go OFF within 2000 ms after the motor drive signal has been generated. . The sensor fails to go ON within 200 ms after it has gone OFF.

Resetting

If the copier is making copies,

(1) The JAM message is indicated.
(2) When the copier is reset after removal of the jam, the TURN POWER ON message is indicated.
(3) When the copier is switched OFF and then ON, a self check is executed; if the result is good, the error is reset and if not, the copier will go into the down state*, indicating 'E5XX' on the display.

If the copier is not making copies,

(1) The TURN POWER ON message is indicated.
(2) When the copier is switched OFF and then ON, a self check is executed; if the result is good, the error is reset and if not, the copier will go into the down state*, indicating 'E5XX' on the display.

In the down state,

(1) 'E5XX' is indicated.
(2) Copies may be made by detaching** the sorter and avoiding modes that use the sorter.
(3) If any mode that uses the sorter is selected, the NOT AVAILABLE message is indicated.
Switch the copier OFF and then ON to execute a self check; keep the sorter connected to the copier.

* When E indication is present.

** Turn the joint sensor (MS1) OFF; the connector may be left connectd.

CHAPTER 4

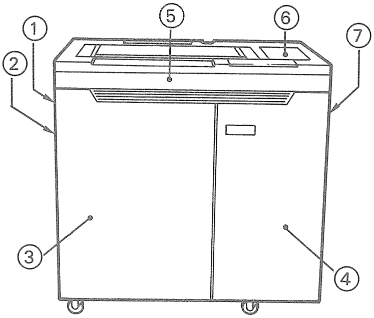
MECHANICAL SYSTEM

1. Disconnect the power cord for safety before disassembly or reassembly work.
2. Group the screws by type (length and diameter) and location.
3. Parts marked S are for the NP-9800 only and may not be used for copiers of the NP-7550, -8570, or -8580 Series.
4. Two of the fixing screws used for external covers are fitted with a washer to protect against static electricity; be sure to use the washer for reassembly.
5. If possible, avoid operating the machine with any of its parts removed.
6. Unless otherwise noted, re-assembly is the reverse of disassembly.

I. EXTERNALS....................................4-1
II. DRIVE SYSTEM..............................4-6
III. FEEDING SYSTEM..........................4-13
IV EXPOSURE SYSTEM.......................4-25
V. CHARGING SYSTEM.......................4-28
VI. DEVELOPMENT SYSTEM...............4-39
VII. CLEANING SYSTEM.......................4-45
VIII. FIXING SYSTEM.............................4-52
IX. ELECTRICAL..................................4-59
X. DUPLEXING UNIT............................4-60
XI. PAPER DECK UNIT..........................4-73

I. EXTERNALS

A. EXTERNAL COVERS



① Delivery assembly cover (2)
② Upper left panel (4)
③ Front left door
④ Front right door
⑤ Upper front panel (4)
⑥ Hopper cover (2)
⑦ Upper right cover (4)

Figure 4-100

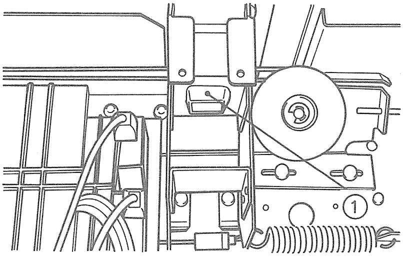
Note:

The number in parentheses indicates the number of mounting screws used.

Remove the covers as necessary for cleaning, inspecting, or repairing the inside of the machine. Covers that can be detached by mere removal of the screws are left out of the procedure.

1. Detaching the Upper Cover

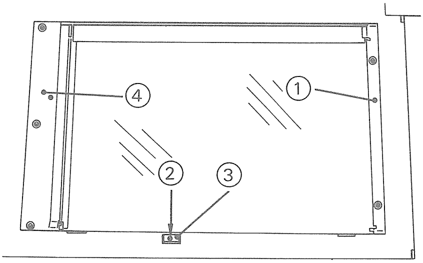
1) Open the front doors, remove the four screws, and detach the upper front panel.
2) Detach the control panel.
3) Detach the upper left panel, rear cover, and upper right cover.
4) Detach the RDF from the copier.
5) Pick the bottom of the bush (left, right), and push it up to detach.



① Bush

Figure 4-101

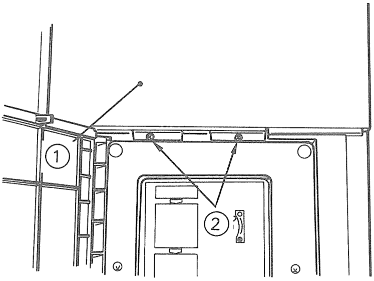
6) Remove the two screws, detach the copyboard glass mount, and detach the copyboard glass.
7) Remove the screw, and detach the magnet plate.
8) Detach the size index plate (vertical).



① Copyboard glass mount
② Screws
③ Magnet plate
④ Size index plate (vertical)

Figure 4-102

9) Detach the face plate for the sub feeder.



① Face plate for sub feeder
② Screws

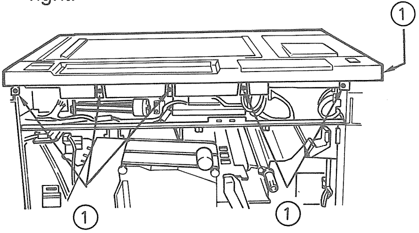
Figure 4-103

10) Detach the hopper top cover.
11) Loosen the eight screws that fix the upper cover in place, and detach the upper cover.

B. CONTROL PANEL

1. Detaching the Control Panel PCB

1) Open the front doors, remove the four screws, and detach the upper front panel.
2) Loosen the screws that fix the control panel in place; five on front, one on right.



① Screws

Figure 4-104

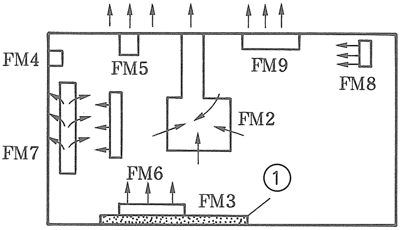
3) Lift the control panel, and disconnect the three connectors from the control panel PCB.

C. FANS AND BLOWERS

1. Outline

The copier is equipped with eight fan (or blower) motors; the main function of each fan motor is as follows:

FM2 :	keeps the copy paper on the feed belt.
FM3 :	cools the scanner.
FM4 :	cools the delivery assembly.
FM5 :	keeps the heat from the fixing assembly away from the drum.
FM6 :	cools the power supply PCB.
FM7 :	cools copy paper.
FM8 :	cools the scanner motor.

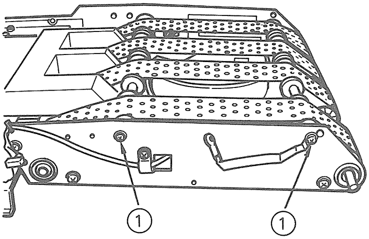


FM9 : circulates air around the drum.
① Dust filter

Figure 4-105

2. Detaching the Feed Fan (FM2)

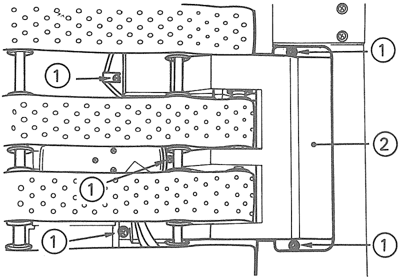
1) Detach the feeder assembly.
2) Turn over the feeder assembly, and remove the two screws.



① Screws

Figure 4-106

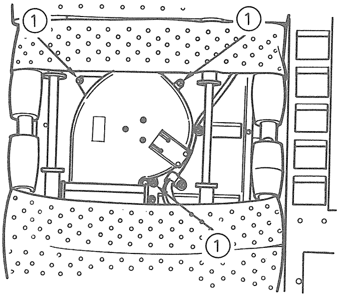
3) Remove the five screws, and detach the duct.



① Screws
② Duct

Figure 4-107

4) Remove the three screws, and detach the feed fan.

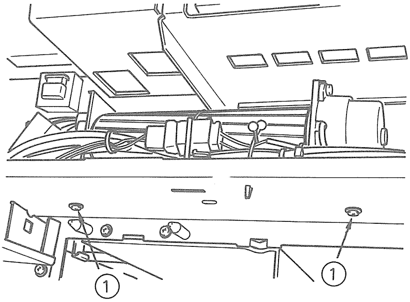


① Screws

Figure 4-108

3. Detaching the Scanner Cooling Fan (FM3)

1) Detach the fixing assembly.
2) Detach the upper front panel.
3) Remove the two screws, disconnect the connector, and detach the scanner cooling fan.

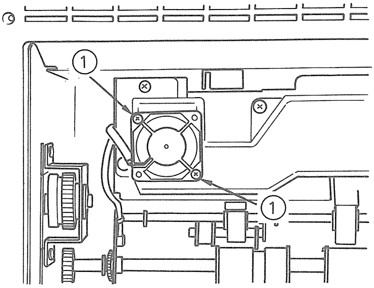


① Screws

Figure 4-109

4. Detaching the Delivery Assembly Exhaust Fan (FM4)

1) Detach the delivery/feeder assembly.
2) Remove the two screws, disconnect the connector, and detach the delivery assembly exhaust fan.

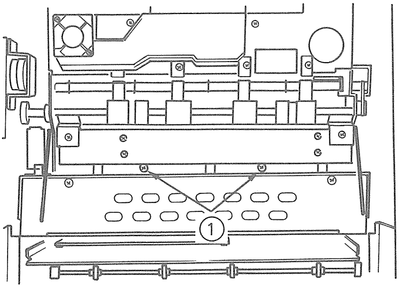


① Screws

Figure 4-110

5. Detaching the Delivery/Feeder Assembly Air Flow Fan (FM7)

1) Detach the delivery/feeder assembly.
2) Remove the two screws, disconnect the connector, and detach the air flow fan.

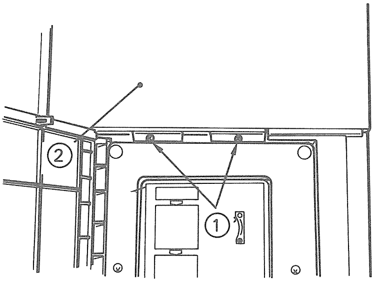


① Screws

Figure 4-111

6. Detaching the Scanner Motor Cooling Fan (FM8)

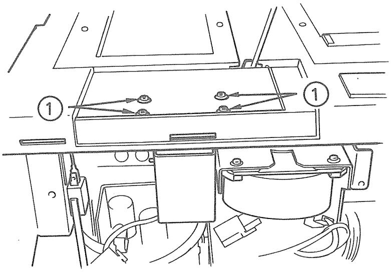
1) Open the hopper top cover, and detach the face plate for the sub feeder.



① Screws
② Face plate for sub feeder

Figure 4-112

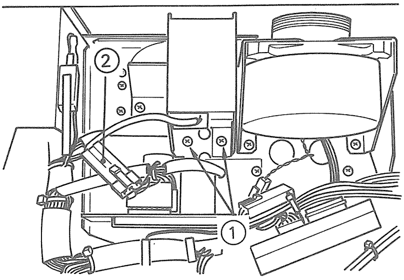
2) Remove the four screws that fix the fan mount in place.



① Screws

Figure 4-113

3) Remove the two screws, disconnect the connector, and detach the scanner motor cooling fan.



① Screws
② Connector

Figure 4-114

II. DRIVE SYSTEM

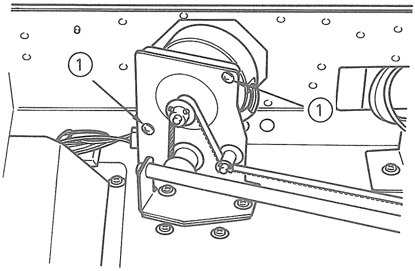
A. LENS DRIVE UNIT

Note :

The unit is adjusted at the factory using special tools and with high precision. As such, do not detach or loosen those parts or screws not discussed herein.

1. Detaching the Lens Drive Motor Belt

1) Detach the copyboard glass.
2) Detach the lens unit cover.
3) Remove the two screws, and detach the lens drive motor.



① Screws

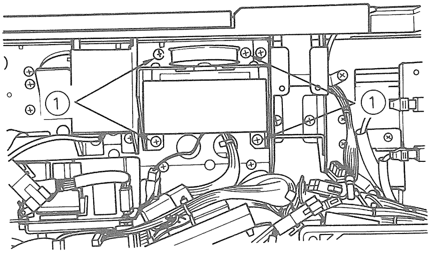
Figure 4-200

4) Detach the lens drive belt.

B. SCANNER DRIVE UNIT

1. Detaching the Scanner Motor (M2)

1) Detach the scanner drive cable.
2) Disconnect the two connectors.
3) Remove the four screws, and detach the scanner motor unit.



① Screws

Figure 4-201

4) Remove the four screws, and detach the scanner motor from the scanner motor mounting plate.

2. Detaching the Scanner Drive Cable

1) Detach the upper cover.
2) Detach the high-voltage transformer unit.
3) Loosen screws A (2 pcs.) shown in Figure 4-202.
4) Loosen screw B shown in Figure 4-202 as much as possible.
5) Detach the spring.
6) Remove screws C (2 pcs.) shown in Figure 4-202, and detach the Cable metal fixing.
7) Remove screws D (2 pcs.) shown in Figure 4-202, and detach the scanner drive cable.

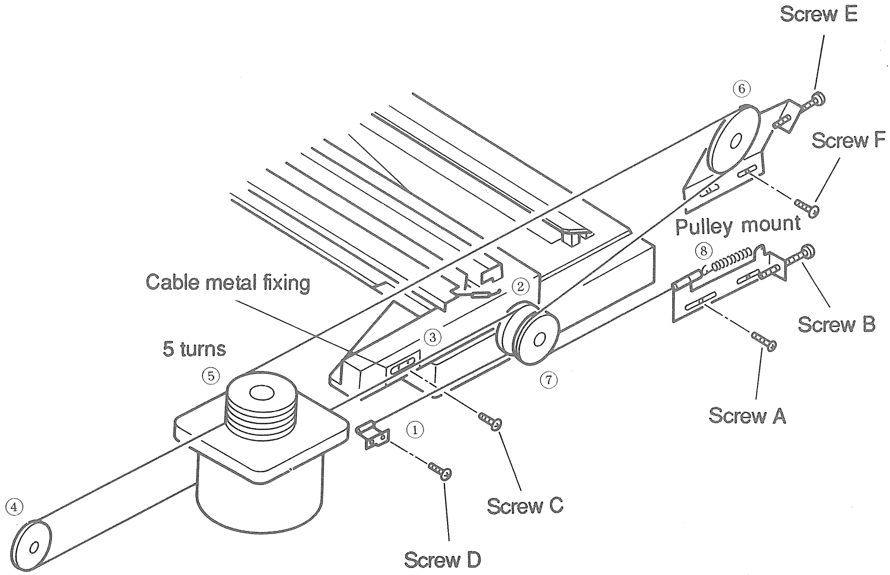

Screw E
⑥
Screw F
Pulley mount
⑧
Cable metal fixing
②
Screw B
③
5 turns
⑤
⑦
Screw A
①
④
Screw C
Screw D

Figure 4-202

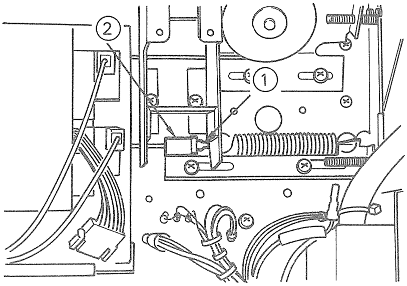
3. Attaching and Adjusting the Scanner Drive Cable

1) Attach the scanner drive cable by routing it in the order given in Figure 4-202.

Note:

Loosen screw E in advance.

2) Tighten screw B fully, and fix the mount using screw A.
3) Tighten screw E; tighten it fully by giving it a further full turn from the point the cable metal fixing and mount come into contact.



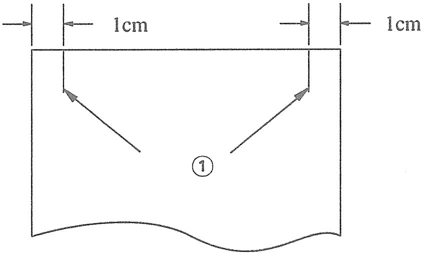
① Cable metal fixing
② Mount

4) Fix the pulley mount using screw F.
5) Adjust the position of the mirror.

Figure 4-203

4. Adjusting the Mirror Position (optical distance between mirrors 1 and 2)

1) Draw lines on a sheet of paper (A4 or A3) 1 cm from both ends.
2) Use the sheet carrying the lines as the original, and make a copy; A.



① Lines

Figure 4-204

3) Place a blank sheet of paper on the copyboard, and feed the sheet carrying lines in the manual mode; B.
4) Match both sheets (A and B) along the left edges.

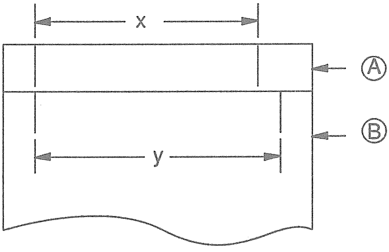
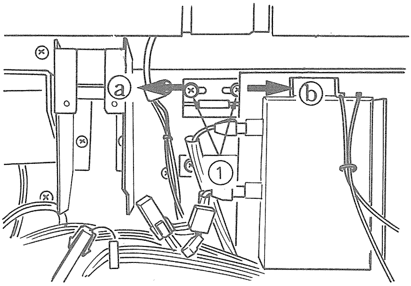


Figure 4-205

5) Compare x and y in Figure 4-205, and adjust the position of the mirror 1 mount so that they are identical; loosen screws C (2 pcs.), and move the mirror 1 mount.
   x=y correct
   x>y Move the mirror 1 mount into the direction of a.
   x<y Move the mirror 1 mount into the direction of b.



① Screws

Figure 4-206

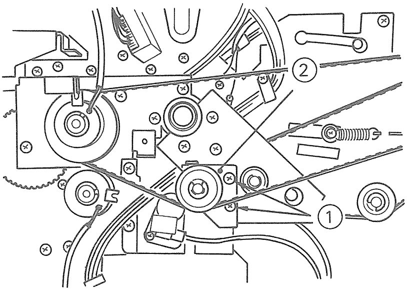
Note:

If the distance between mirrors 1 and 2 is short, the copy image will be enlarged.

C. MAIN MOTOR UNIT

1. Detaching the Main Motor Unit

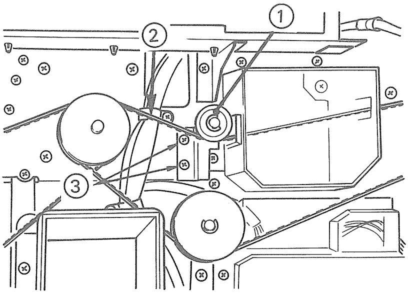
1) Detach the driver PCB unit.
2) Mark the position of the tension pulley plate using a scriber, loosen the two screws, and detach the pick-up drive belt.
3) Mark the position of the tension pulley plate using a scriber, loosen the two screws, and slacken the drive belt.



① Screws
② Tension pulley plate

Figure 4-208

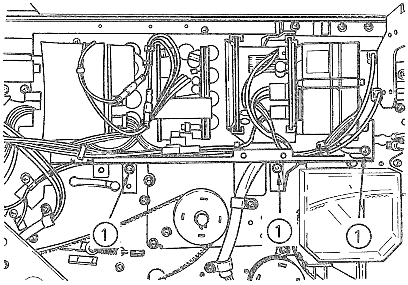
4) Detach the exhaust fan (FM5) together with the mounting metal fixing.
5) Mark the position of the tension pulley plate using a scriber.
6) Loosen the two screws, and detach the tension pulley plate and fixing assembly drive belt.



① Tension pulley plate
② Fixing assembly drive belt
③ Screws

Figure 4-209

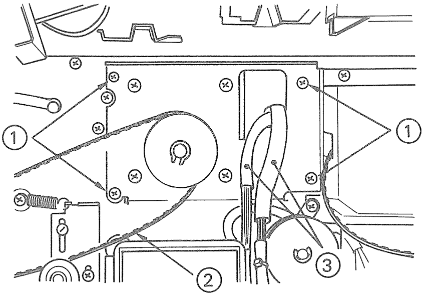
7) Remove the three screws, and detach the bottom plate from the high-voltage unit.



① Screws

Figure 4-210

8) Disconnect the connector of the main motor, and lead the harness into the copier.
9) Remove the three screws.
10) Detach the drum drive belt from the main motor unit, and detach the main motor unit.



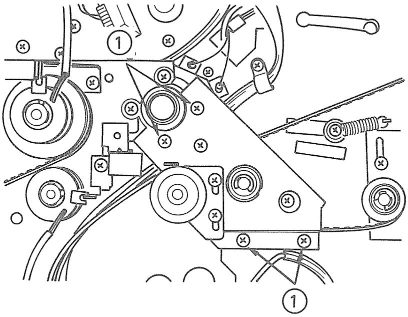
① Screws
② Drum drive belt
③ Harness

Figure 4-211

D. DRUM DRIVE UNIT

1. Detaching the Drum Drive Unit

1) Release the drum cleaning unit and feeder assembly.
2) Detach the drum fan.
3) Detach the driver PCB unit.
4) Detach the pick-up drive belt.
5) Loosen the screw on the tension plate of the drum drive belt.
6) Remove the four screws, and detach the drum drive unit together with the drum drive belt.



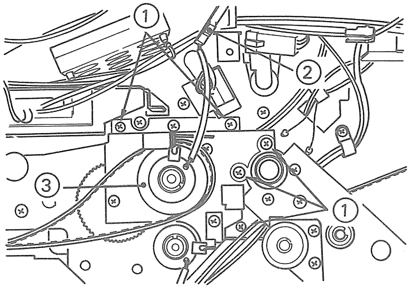
① Screws

Figure 4-212

E. DEVELOPING ASSEMBLY DRIVE UNIT

1. Detaching the Developing Assembly Drive Unit

1) Detach the developing assembly and pre-transfer corona assembly.
2) Detach the drum fan.
3) Detach the driver PCB unit.
4) Detach the pick-up drive belt.
5) Detach the registration clutch.
6) Disconnect the connector of the pre-transfer high-voltage cable from the transformer.
7) Disconnect the connector of the developing clutch (CL5).
8) Remove the five screws, and detach the developing assembly drive unit.



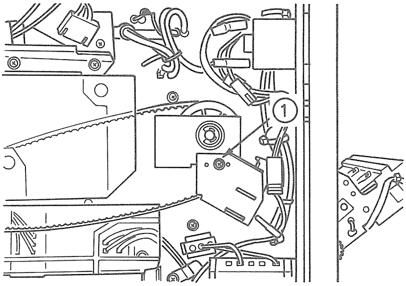
① Screws
② Developing assembly clutch connector
③ Registration clutch

Figure 4-213

F. FIXING ASSEMBLY DRIVE UNIT

1. Detaching the Fixing Assembly Drive Unit

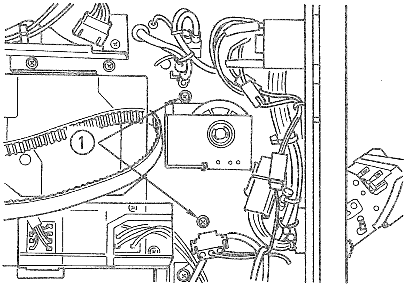
1) Detach the fixing assembly.
2) Remove the screw, and detach the fixing assembly drive OFF clutch unit.



① Screw (M3X6)

Figure 4-214

3) Detach the fixing assembly drive belt.
4) Remove the two screws, and detach the fixing assembly drive unit.



① Screws

Figure 4-215

III.FEEDING SYSTEM

A. PICK-UP CONTROL UNIT

1. Detaching the Cassette Holder

1) Detach the upper right cover and right cover.
2) Remove the five screws and two fastons, and detach the manual feed tray.

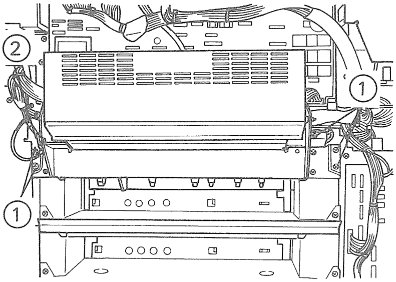
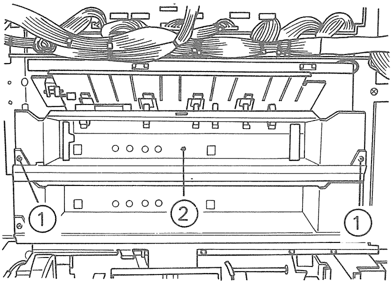


Figure 4-300

① Screws
② Fastons

3) Mark the position of the cassette holder; then, remove the screws, and detach the cassette holder.



① Screws
② upper cassette holder

Figure 4-301

2. Positioning the Cassette Holder

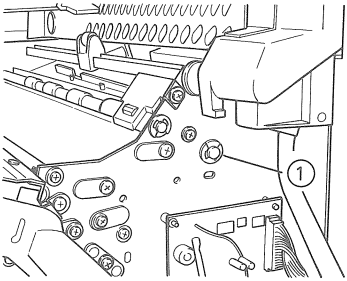
Make a copy in the DIRECT mode, and move the cassette holder to the left and right until the registration on both left and right is 0±1.5 mm.

3. Detaching the Pick-Up Roller

The upper cassette pick-up roller and lower cassette pick-up roller may be detached in the same way; to detach the upper cassette pick-up roller, work as follows:

1) Detach the upper right cover and rear cover.
2) Detach the upper cassette holder.
3) Detach the process cover.
4) Detach the developing assembly.

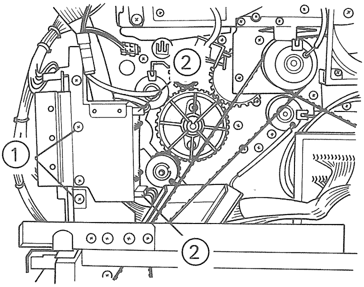
5) Remove the E-ring, and detach the bushing (front).



① E-ring

Figure 4-302

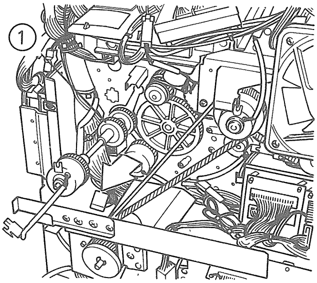
6) Remove the two screws, and disconnect the two connectors; then, detach the M2 power supply PCB.



① Screws
② Connector

Figure 4-303

7) Disconnect the connector of the clutch.
8) Hold the pick-up roller shaft, and detach the pick-up roller through the hole in the rear side plate together with the shaft.



① Pick-up roller

Figure 4-304

4. Replacing the Pick-Up Roller

Replace the rubber pieces only; replace the pick-up rollers as a set of six.

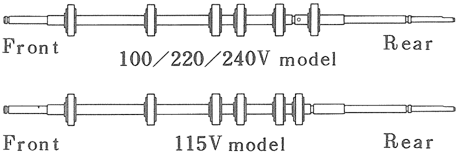
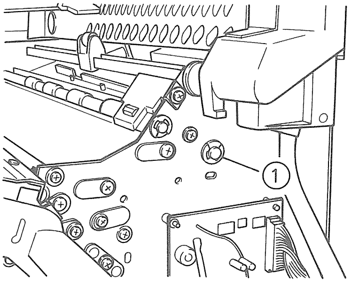


Figure 4-305

B. MANUAL FEED PICK-UP UNIT

1. Detaching the Manual Feed Pick-Up Unit

1) Detach the upper right cover.
2) Detach the cover found under the developing assembly, and remove the E-ring and detach the bushing from the upper cassette pick-up roller shaft.



① Pick-up roller shaft

Figure 4-306

3) Remove the five screws, and detach the manual feed tray.
4) Detach the upper cassette holder.
5) Release the upper pick-up roller as shown in Figure 4-307.

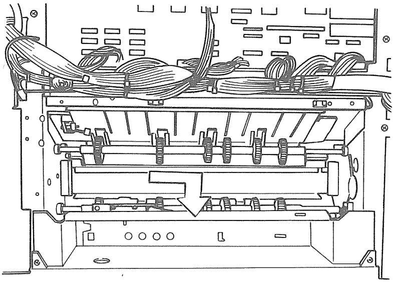
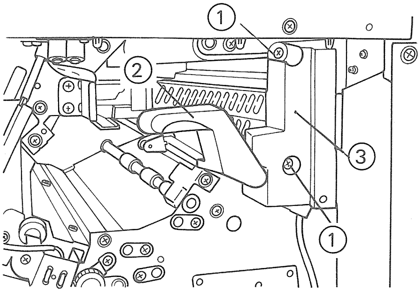


Figure 4-307

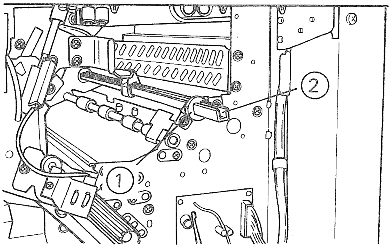
6) Detach the grip and cover from the developing assembly.



① Screw
② Grip (developing assembly)
③ Cover

Figure 4-308

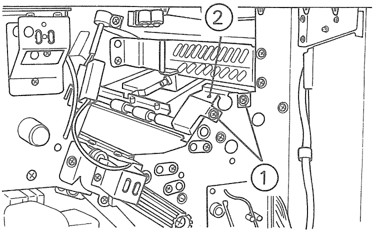
7) Detach the bushing, and detach the developing assembly pressure lever.



① Bushing
② Pressure lever

Figure 4-309

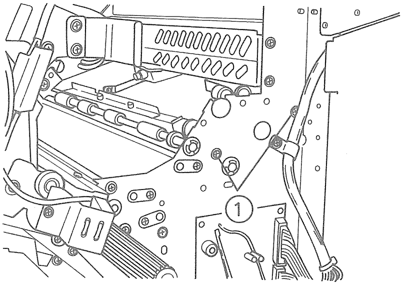
8) Remove the two screws, and detach the manual feed pick-up unit upper cover.



① Screw
② Upper cover

Figure 4-310

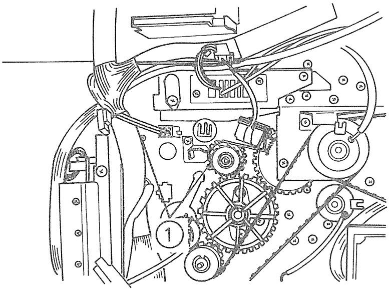
9) Remove the two screws (front) that hold the manual pick-up unit in place.



① Screw

Figure 4-311 (front)

10) Disconnect the connector of the manual pick-up unit.
11) Remove the two screws (rear) that hold the manual pick-up unit in place.



① Screw

Figure 4-312 (rear)

12) Disconnect the connector from the rear side plate, and detach the manual feed pick-up unit.

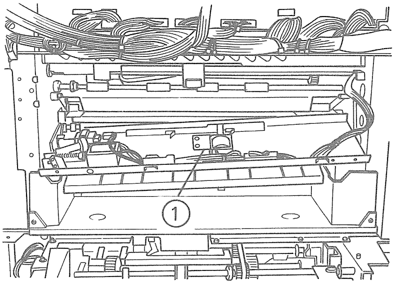


Figure 4-313

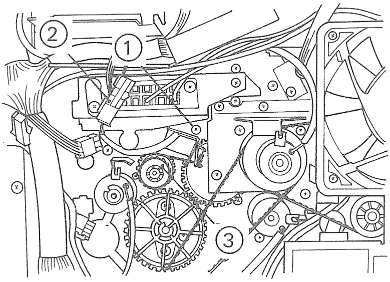
① Manual feed pick-up unit

Note:

When attaching the manual feed tray to the copier, make sure that the registration roller gear and slope roller are in contact with each other.

2. Detaching the Manual Feed Pick-Up Roller

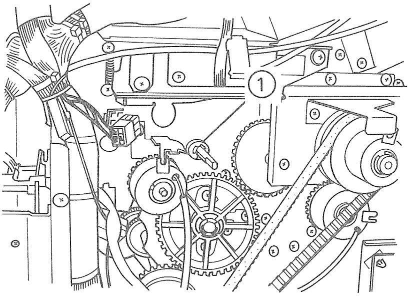
1) Detach the developing assembly.
2) Detach the pre-transfer corona assembly.
3) Detach the front right cover.
4) Remove the screw, and disconnect the connector; then, detach the manual feed pick-up clutch unit.



① Screw
② Connector
③ Manual feed pick-up clutch unit

Figure 4-314

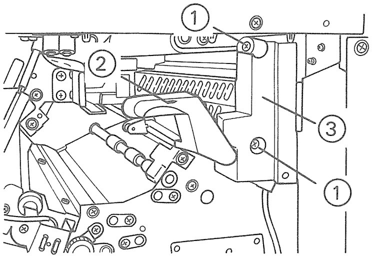
5) Remove the E-ring, and detach the bushing (rear).



① E-ring

Figure 4-315

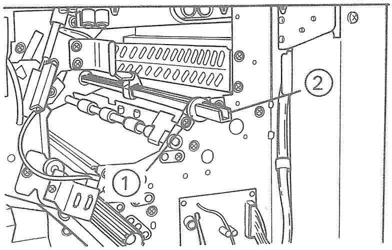
6) Detach the grip and cover from the developing assembly.



① Screw
② Grip (developing assembly)
③ Cover

Figure 4-316

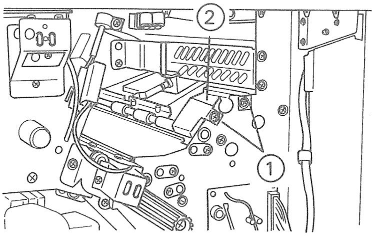
7) Detach the bushing, and detach the developing assembly pressure lever.



① Bushing ② Pressure lever

Figure 4-317

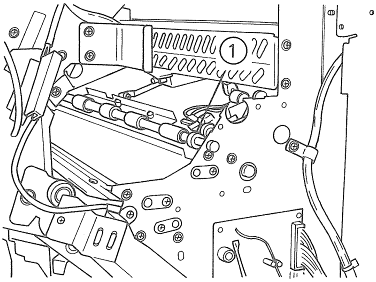
8) Remove the two screws, and detach the manual feed pick-up unit upper cover.



① Screws ② Upper cover

Figure 4-318

9) Remove the E-ring, and detach the bushing (front).



① E-ring

Figure 4-319

10) Push the manual feed pick-up roller to the rear, and slide it out while lifting its front end.

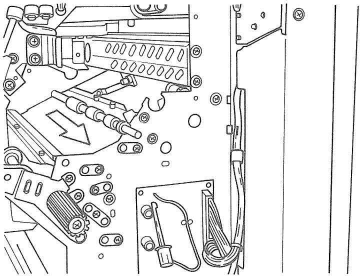


Figure 4-320

C. FEEDER ASSEMBLY

1. Construction

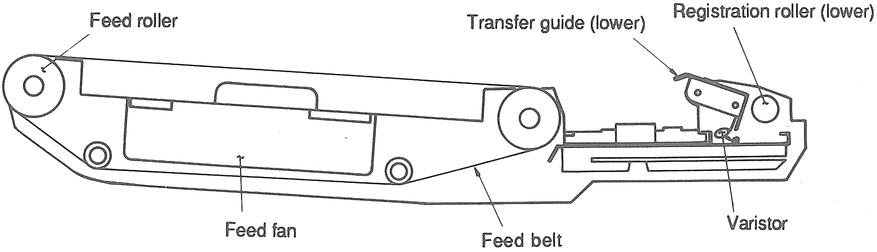
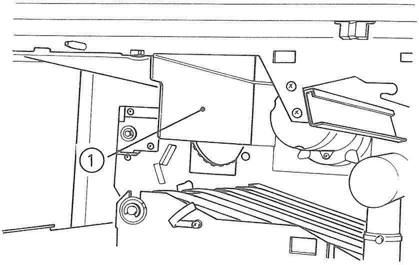

Feed roller
Transfer guide (lower)
Registration roller (lower)
Feed fan
Feed belt
Varistor

Figure 4-321

2. Detaching the Feeder Assembly

1) Detach the process cover, fixing assembly cover, and inside center cover.
2) Detach all corona assemblies.
3) Detach the developing assembly, photosensitive drum, drum cleaning unit, and fixing assembly.
4) Detach the copyboard glass.
5) Take out four screws from the lens box in preparation for the detachment of the thermal upper cover from the fixing assembly.

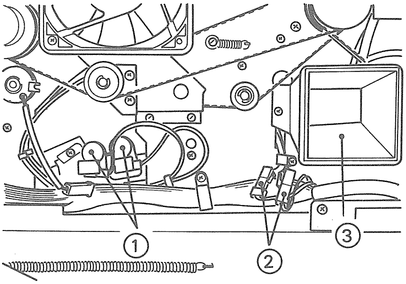


① Thermal upper cover

Figure 4-322

6) Detach the driver PCB UNIT.
7) Disconnect the high-voltage connector of the transfer/separation corona assembly.

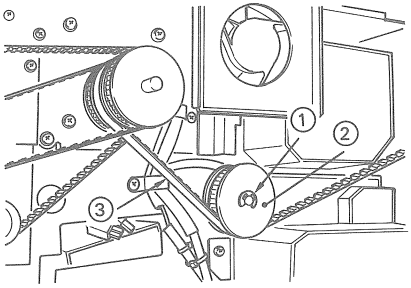
8) Detach the duct of the feed fan, and disconnect the two connectors.



① High-voltage connectors
② Connectors
③ Duct

Figure 4-323

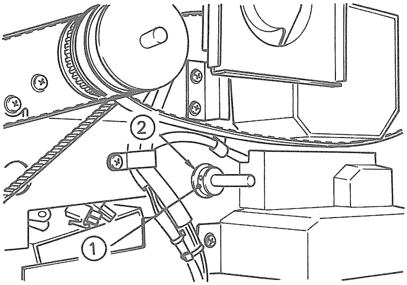
9) Loosen the screw on the tension plate of the fixing assembly drive belt.
10) Detach the E-ring, and detach the pulley; take care not to drop the pin.



① E-ring
② Pulley
③ Fixing assembly drive belt

Figure 4-324

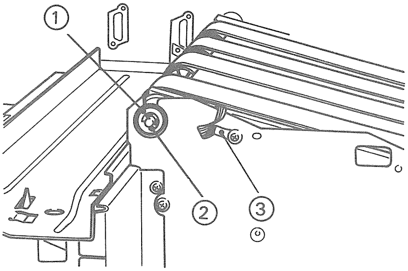
11) Loosen the hex screw, detach thrust stopper, and detach the ball bearing.



① Thrust stopper
② Ball bearing

Figure 4-325

12) Detach the grounding wire.
13) Detach the E-ring, and detach the ball bearing.



① Ball bearing
② E-ring
③ Grounding wire

Figure 4-326

14) Tape the feed guide plate from the deck in place.

15) Lift the feeder assembly to detach.

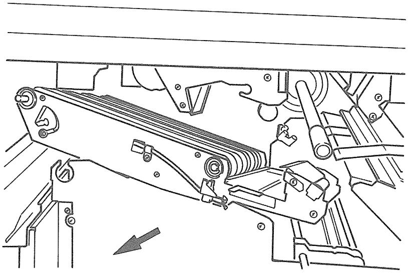
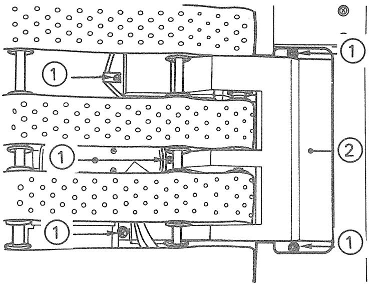


Figure 4-327

3. Detaching the Feed Belt

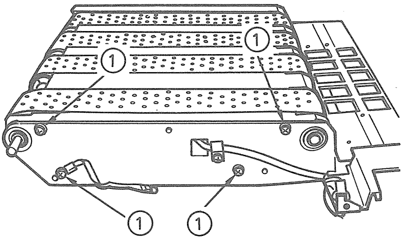
1) Remove the five screws, and detach the duct.



① Screws
② Duct

Figure 4-328

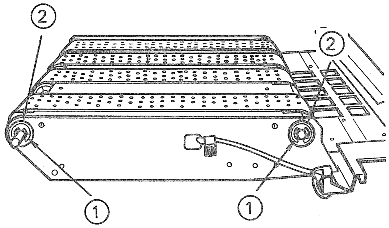
2) Remove the four screws.



① Screws

Figure 4-329

3) Detach the two E-rings and two ball bearings.



① E-rings
② Ball bearings

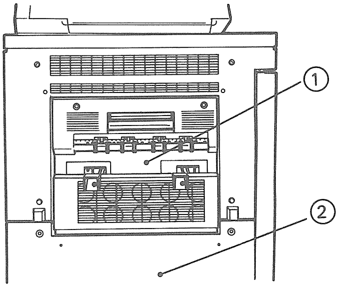
Figure 4-330

4) Detach the feed belt.

D. DELIVERY ASSEMBLY AND DELIVERY/FEEDER ASSEMBLY

1. Detaching the Delivery/Feeder Assembly

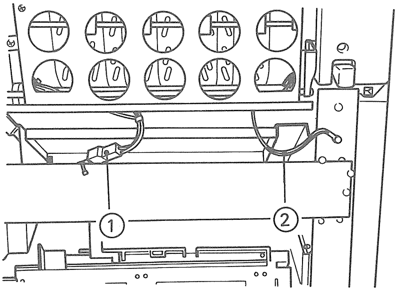
1) Detach the delivery assembly cover and lower left cover.



① Delivery assembly cover
② Lower left cover

Figure 4-331

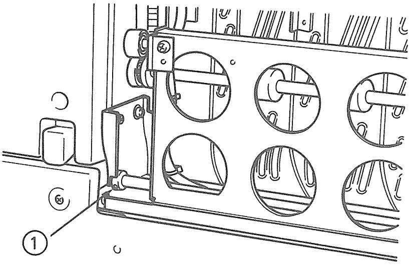
2) Disconnect the connector, and detach the grounding wire.



① Connector
② Grounding wire

Figure 4-332

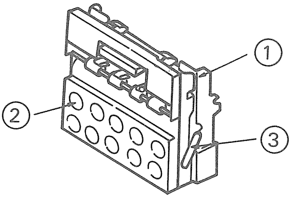
3) Loosen the hex screw on the lower left.



① Hex screw

Figure 4-333

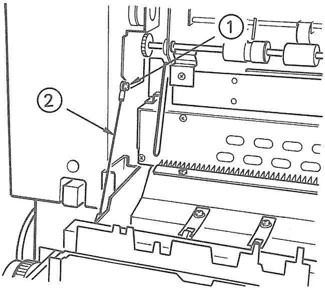
4) Remove the two stepped screws, and detach the two links that hold the delivery assembly and delivery/feeder assembly together.



① Delivery/feeder assembly
② Feeder assembly
③ Link

Figure 4-334

5) Remove the stepped screw, and detach the wire that fixes the delivery/feeder assembly in place.



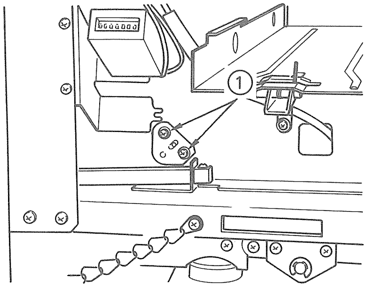
① Stepped screw
② Wire

Figure 4-335

6) Move the delivery/feeder assembly to the rear, and detach it.

2. Detaching the Delivery Assembly

1) Detach the fixing assembly cover.
2) Detach the fixing assembly.
3) Detach the rear cover, and disconnect the two connectors from the delivery assembly.
4) Remove the two screws from the front side support plate of the delivery assembly.



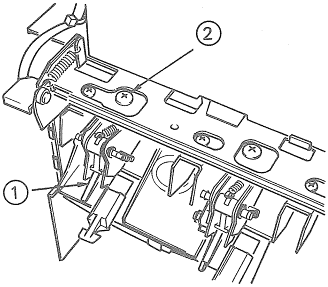
① Screws

Figure 4-336

5) Support the delivery assembly by hand, detach the support shaft plate at the front, and detach the delivery assembly.

3. Detaching the Upper Separation Claw/Lower Separation Claw

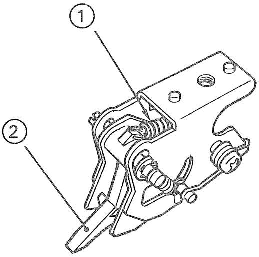
1) Open the delivery assembly.
2) Remove the screw, and detach the upper separation claw unit.



① Upper separation claw
② Screw

Figure 4-337

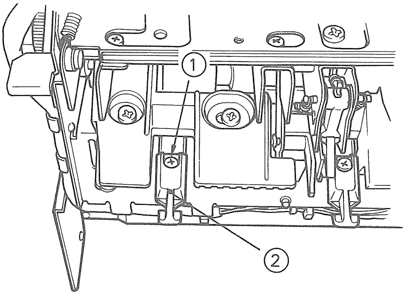
3) Detach the spring, and detach the upper separation claw.



① Spring
② Upper separation claw

Figure 4-338

4) Remove the screw, and detach the lower separation claw.



① Screw
② Lower separation claw

Figure 4-339

4. Cleaning

Dirt and wear on the separation claw or damage on its tip tends to soil copy paper or leads to jams; such conditions also damage the surface of the roller and, therefore, it is important to clean the claw on a periodical basis. Use lint-free paper or dry cloth; if cakes of toner are found, use an alcohol solution together with lint-free paper.

5. Adjusting the Position of the Deflector Solenoid

Attach the solenoid so that the distance to the plunger is 0.2 mm with the deflector butted against the upper guide plate.

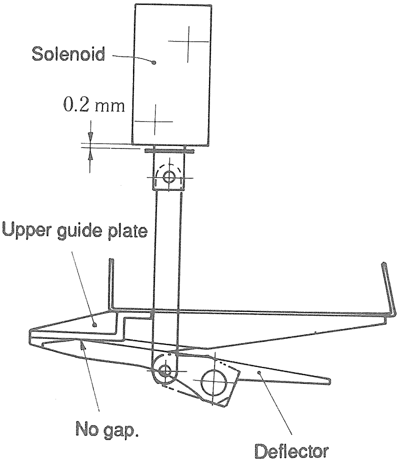


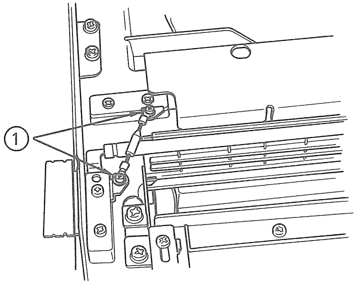
Figure 4-340

IV. EXPOSURE SYSTEM

A. ORIGINAL ILLUMINATION SYSTEM

1. Detaching the Thermal Fuse and Scanning Lamp

1) Detach the copyboard glass.
2) Move the mirror 1 mount to the center.
3) Detach the thermal fuse cover.
4) Remove the two screws, and detach the thermal fuse.



① Screws

Figure 4-400

5) Push the scanning lamp to the front to detach it.

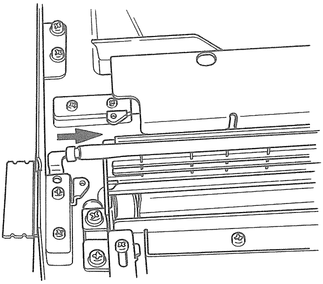


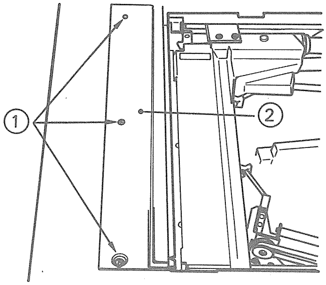
Figure 4-401

Note:

i. Do not perform the work while the scanning lamp is hot.
ii. Do not leave fingerprints on the scanning lamp; if the lamp is soiled, dry wipe it.

2. Detaching the Standard White Plate

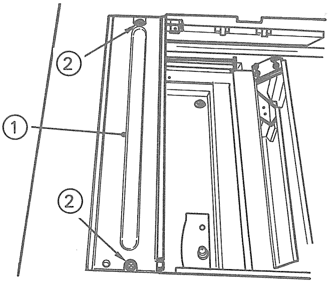
1) Detach the copyboard glass.
2) Remove the three screws, and detach the size index (vertical).



① Screws
② Size index (vertical)

Figure 4-402

3) Move the mirror 1 mount to the right.
4) Remove the two screws, and detach the standard white plate.



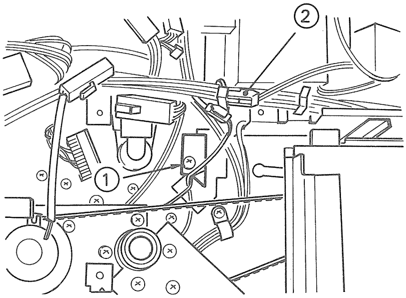
① Standard white plate
② Screws

Figure 4-403

B. PRE-EXPOSURE LAMP

1. Detaching the Pre-Exposure Lamp Unit

1) Detach the drum fan.
2) Remove the screw, disconnect the connector, and pull out the pre-exposure lamp.



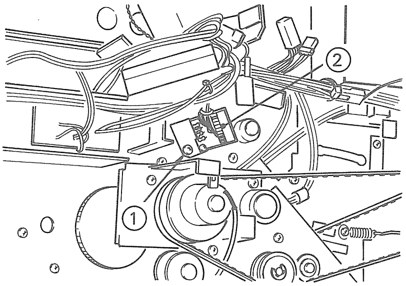
① Screw
② Connector

Figure 4-404

C. BLANK EXPOSURE LAMP UNIT

1. Detaching the Blank Exposure Lamp

1) Detach the drum fan.
2) Remove the screw, and disconnect the connector; at the time, take care so that the soldered face of the print plate of the blank exposure lamp unit will not come into contact with the side plate.



① Screw
② Connector

Figure 4-405

3) Remove the five screws, and pull out the blank exposure lamp.

2. Canceling the Standard Framing Function

The non-image width on the right and left sides may be set to 0 mm if the user so desires; perform the following:

1) Draw lines on both sides of A3 copy paper as shown in Figure 4-406; 15 cm long, 1 cm from the top; the paper will be referred to as paper A.

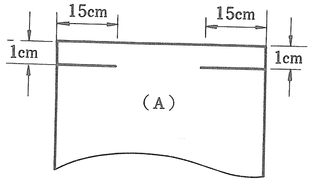


Figure 4-406

2) Use paper A as the original, and make a copy in the sheet frame erasing mode; the copy will be referred to as paper B.

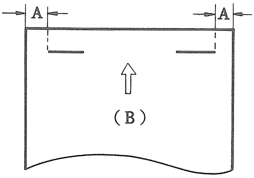
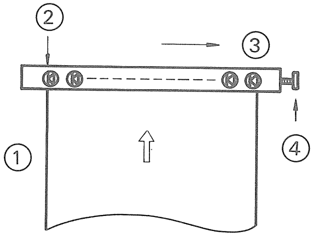


Figure 4-407

3) Set MS-6 to '1' in the service mode (✻ 5 ✻).
4) Switch the copier OFF, and disconnect the power plug.
5) Switch the copier ON, and check that MS-6 is set to '1'.
6) Use paper A as the original, and make a copy in the sheet frame erasing mode; the copy will be referred to as paper C.
7) Put paper B and paper C together, and adjust the position of the blank exposure lamp so that the non-image width shown in Figure 4-408 is about 'A - 3 mm'.



① Front of the copier.
② This LED goes OFF.
③ Move the blank exposure lamp to the rear.
④ Turn the screw to the right.

Figure 4-408

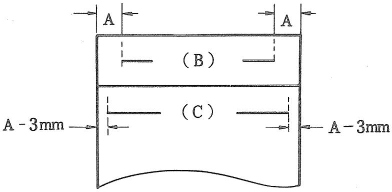


Figure 4-409

8) Make a copy using paper A as the original in DIRECT, and check that the non-image width on the left and right is 0 +1.5 mm.

Note:

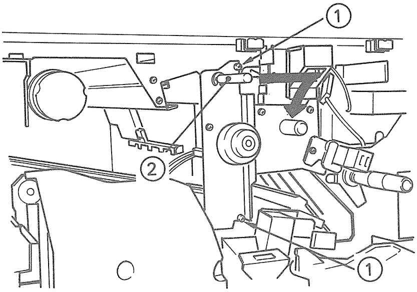
The non-image width on both left and right in the sheet frame erasing mode will be smaller by about 3 mm after the adjustment.

V. CHARGING SYSTEM

A. PHOTOSENSITIVE DRUM

1. Detaching the Photosensitive Drum

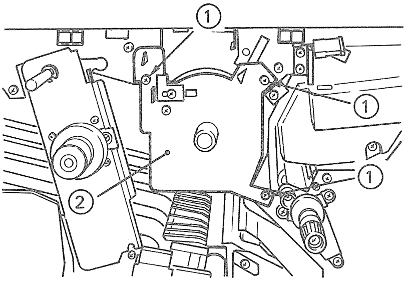
1) Open the front doors.
2) Release the feeder assembly and developing assembly.
3) Remove the three screws, and detach the process cover.
4) Detach the primary corona assembly, disconnect the connector, and detach the pre-transfer corona assembly.
5) Loosen the two screws, pull the grip of the cleaner to the front, and lower it to the left to release the cleaning unit.



① Screws
② Grip

Figure 4-500

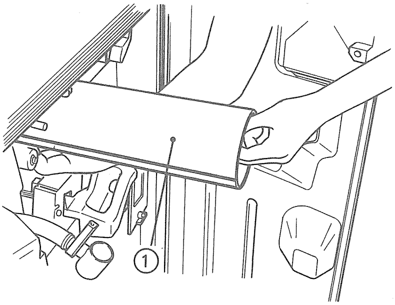
6) Remove the three screws, and detach the drum positioning plate.



① Screws
② Drum positioning plate

Figure 4-501

7) Attach the protective sheet to the drum.
8) Slide out the drum slowly; hold it at both ends, and lift it to detach.



① Drum

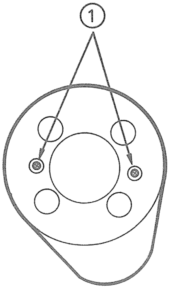
Figure 4-502

Note:

The rear end of the drum has a drum gear and, therefore, the drum is heavier at the rear. Take care not to drop the drum when sliding it out; after detaching it, keep it in a place where it is free from direct rays of the sun, dust, or shock.

2. Replacing the Photosensitive Drum and Drum Heater

1) Detach the photosensitive drum from the copier.
2) Remove the two screws.



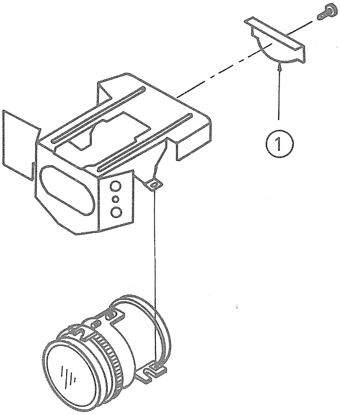
① Screws

Figure 4-503

3) Remove the flange at the front.
4) Disconnect the connector, and detach the drum from the rear flange together with the drum heater.

Note:

i. When replacing the photosensitive drum, set the drum sensitivity as shown on the label attached to the inside of the drum.
ii. Check if a round, blue seal is attached to the photosensitive drum; if the seal is found, attach the drum sensitivity correction mask to the lens unit.



① Mask

Figure 4-505

If the drum sensitivity mask is not to be attached to the lens unit, screw it in place under mirror 2.

3. Cleaning

If the photosensitive drum is soiled, dry wipe it using lint-free paper.

If the dirt or cakes of toner cannot be removed, clean it as follows:

1) Dry wipe the photosensitive drum using lint-free paper to remove the toner on the drum.
2) Dip lint-free paper in an alcohol solution, and wipe the drum with it.
3) Dry wipe the drum using lint-free paper to remove any traces of the solution.

Note:

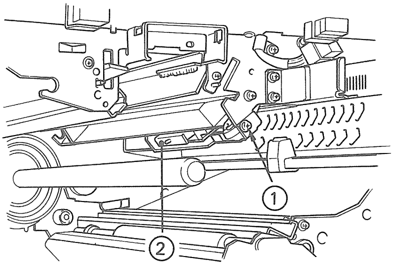
i. The photosensitive drum will be damaged if wiped using paper, lint-free or otherwise, that carries foreign matter. Make sure that the paper is free of metal particles or dust before using it; do NOT use drum cleaning powder (CK-0429).

ii. If the drum is charged without removing toner, it can suffer damage. For this reason, do NOT make copies with the drum cleaning unit disengaged.

B. POTENTIAL SENSOR

1. Detaching the Potential Sensor

1) Detach the upper front panel.
2) Detach the photosensitive drum from the copier.
3) Remove the screw, and detach the potential sensor.



① Screw
② Potential sensor

Figure 4-506

4) Disconnect the connector from the potential measuring PCB.

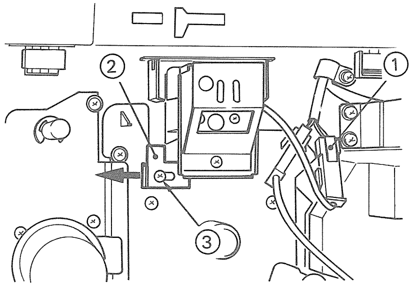
Note:

The position of the potential sensor need not be adjusted; when replacing the potential sensor, however, replace it together with the potential measuring PCB. Make sure that the Nos. of the potential sensor and potential measuring PCB are identical.

C. PRIMARY CORONA ASSEMBLY

1. Detaching the Primary Corona Assembly

1) Open the front doors.
2) Remove the four screws, and detach the process cover.
3) Disconnect the connector.
4) Loosen the screw, and slide the corona assembly fixing plate.
5) Detach the primary corona assembly.



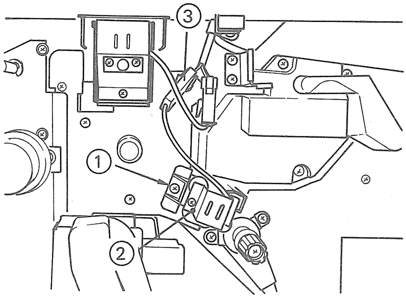
① Connector
② Corona assembly fixing plate
③ Screw

Figure 4-507

D. PRE-TRANSFER CORONA ASSEMBLY

1. Removing the Pre-Transfer Corona Assembly

1) Open the front doors.
2) Release the feeder assembly.
3) Remove the four screws, and detach the process cover.
4) Disconnect the connector of the pre-transfer corona assembly.
5) Remove the screw, and slide out the pre-transfer corona assembly to the front to detach.



① Screw
② Pre-transfer corona unit
③ Connector

Figure 4-508

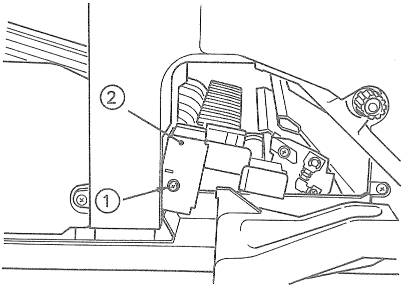
Note:

When attaching the transfer corona assembly, make sure that the arm for the roller electrode is attached to the cam correctly.

E. TRANSFER CORONA ASSEMBLY

1. Detaching the Transfer Corona Assembly

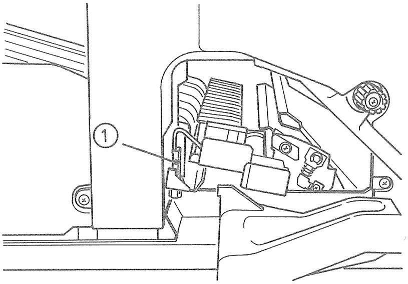
1) Release the feeder assembly.
2) Remove the screw, and detach the transfer corona assembly cover.



① Screw
② Transfer corona assembly cover

Figure 4-509

3) Disconnect the connector, and slide out the transfer corona assembly.



① Connector

Figure 4-510

F. CORONA WIRES

1. Outline

A total of three corona assemblies, i.e., primary, pre-transfer, and transfer/separation, are located around the photosensitive drum.

The corona wires used for the assemblies are 0.06 mm in diameter. The grid wire is a wire not gold-plated and is 0.1 mm in diameter; however, it may be replaced with a gold-plated wire when servicing the copier.

2. Detaching the Wire Cleaner of the Primary Corona Assembly

1) Pick the wire cleaner, and disengage the hook using a flat-blade screwdriver.

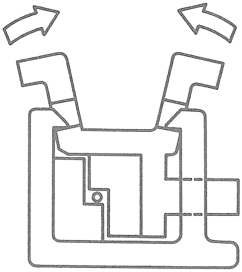
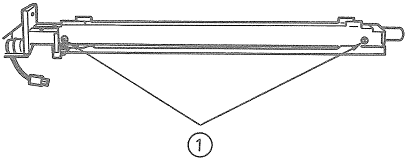


Figure 4-511(cross section)

3. Attaching the Corona Wires

As a rule, all corona wires, except the grid wire, is attached the same way; as such, the discussion that follows uses the primary corona assembly as an example.

1) Detach the shield plate (left, right) of the corona assembly.



① Mounting screws

Figure 4-512

2) Detach the wire cleaner.

Note:

For other corona assemblies, detach the two lids.

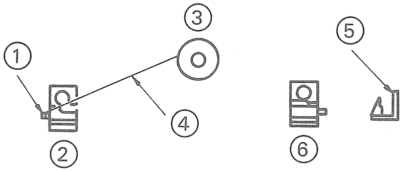
3) Free a length of about 5 cm from a 0.06-dia. wire reel, and form a loop of about 2 mm dia. at the end.

Note:

To form a loop, wind the wire around a hex key, and turn the hex key three to four times.

4) Cut off the end (excess) of the corona wire using a nipper.

5) Hook the loop of the corona wire on the stud.



①	Stud	④	Corona wire
②	(front)	⑤	Corona electrode
③	Reel	⑥	(rear)

Figure 4-513

6) Hook the corona wire on the corona wire positioning plate at the rear, hook the corona wire tension spring on the corona wire at the position shown in Figure 4-514, and twist it.

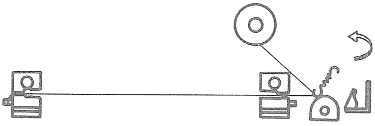


Figure 4-514

7) Cut the excess using a nipper.

8) Pick the end of the tension spring using tweezers, and hook it on the corona electrode.

If for the pre-transfer corona assembly, hook the loop of the corona wire on the corona electrode, and hook the spring on the pin at the front.

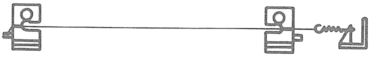


Figure 4-515

Note:

i. Check that the corona wire is free of bends or twists and its gold-plating has not peeled.

ii. Check that the corona wire is in the V-groove serving as a positioner.

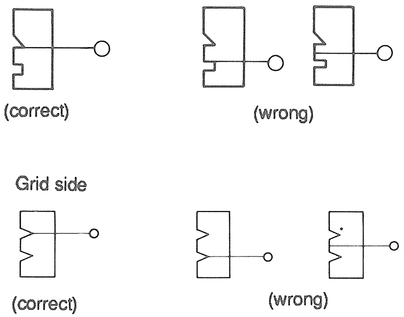


Figure 4-516 Primary Corona Wire

9) Attach the cushion to the front of the corona assembly; not applicable to the primary corona assembly.

10) Attach the shield plate (left, right).

Note:

Attach the two lids for other corona assemblies.

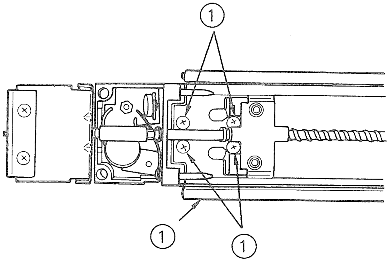
11) Attach the wire cleaner; pay attention to the orientation of the cleaner.

12) Wipe the corona wire using lint-free paper moistened with alcohol solution.

4. Attaching the Grid Wire for the Primary Corona Assembly

1) Loosen the two screws that fix the shield plates (left, right) in place at the front.

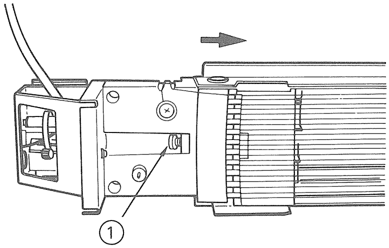
2) Loosen the four screws that fix the motor unit in place at the front.



① Screws

Figure 4-517

3) Loosen the screw, move it into the direction shown in Figure 4-518, and tighten it temporarily.



① Screw

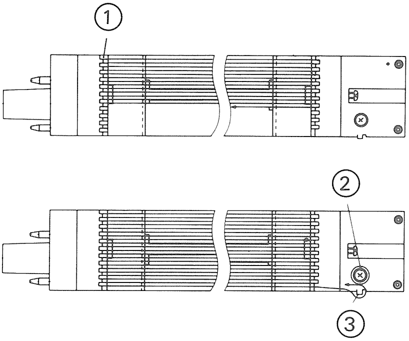
Figure 4-518

4) Free a length of about 5 cm from a 0.1mm-dia. wire reel, and form a loop of about 2 mm dia. at the end.

Note:

To form a loop, wind the wire around a hex key, and turn the hex key three to four times.

5) Cut the end (excess) of the grid wire using a nipper.
6) Hook the loop on stud A shown in Figure 4-519.
7) Wind the grid wire (after 21 trips) on stud B (1 turn); thereafter, put its end between the washer and motor unit, wind it around the stop screw (1 clockwise turn), and fix it in place using the stop screw.



① Stud A
② Stop screw
③ Stud B

Figure 4-519

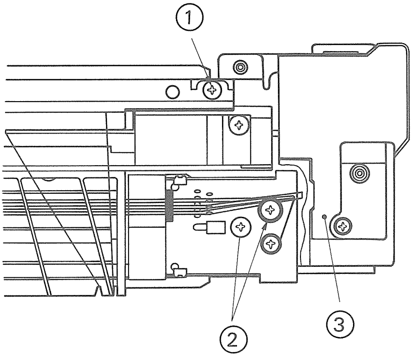
8) Cut the excess using a nipper.
9) Tighten the screw loosened in step 3). Tighten the screw until the tension on the grid wire is even.
10) Tighten the screw loosened in step 2).
11) Wipe the grid wire using lint-free paper moistened with alcohol solution.

Note:

i. Check that the grid wire is free of bends and twists.
ii. Check that the grid wire intervals are regular; i.e., the wire is in the groove of the block.

5. Attaching the Grid Wire for the Separation Corona Unit

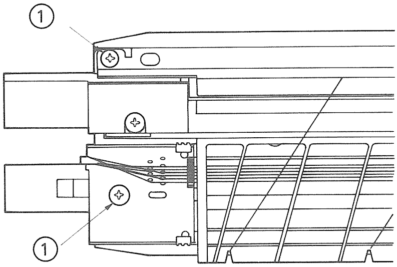
1) Remove the screw, and detach the corona assembly cover from the corona assembly.
2) Remove the three screws that fix the grid wire unit in place.



① Screw
② Screws
③ Corona assembly cover

Figure 4-520

3) Remove the two screws that fix the grid wire unit in place at the rear.



① Screws

Figure 4-521

4) Detach the grid wire unit and gut wire unit from the corona assembly; at the time, take care not to break the gut wire.
5) Free a length of about 5 cm from a 0.06mm-dia. wire reel, and form a loop of about 2 mm dia. at the end.

Note:

To form a loop, wind the wire around a hex key, and turn the hex key three to four times.

6) Cut the end (excess) of the corona wire using a nipper.
7) Hook the loop on stud A shown in Figure 4-522.
8) Wind the grid wire (after 6 trips) on stud A (1 turn); thereafter, put the end between the washer and block (front), wind it around the stop screw (1 clockwise turn), and fix it in place using the screw.
9) Wipe the grid wire using lint-free paper moistened with alcohol solution.

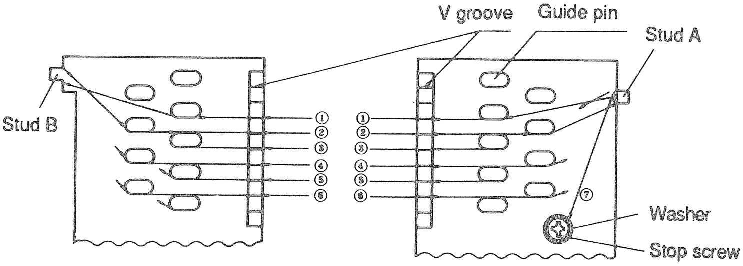


Figure 4-522

Note:

i. Check that the grid wire is free of bends and twists.
ii. Check that the grid wire intervals are regular; i.e., the wire is in the groove of the block.

9) Attach the grid wire unit on the corona assembly, and screw it in place.

6. Standards and Adjustments

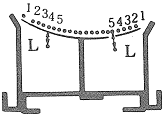
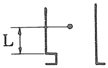
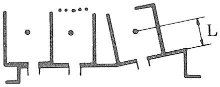
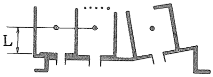
Corona assembly	Standard position	L (lenght; mm)
Primary	Notation on label  	7.5 or more
Pre-transfer	 	10
Transfer	 	10
Separa-tion	 	15.2

Figure 4-523

Note:

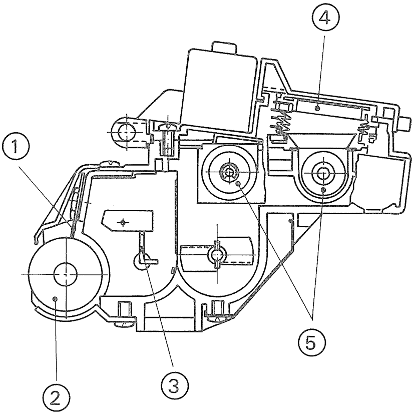
The height (position) of each corona wire can be adjusted by turning the screw behind the corona assembly. A full turn of the screw moves the position by about 0.7 mm.

Each corona wire has a cushion at its front; correct its position after adjusting the height of the corona wire using the adjusting screw.

VI. DEVELOPMENT SYSTEM

A. DEVELOPING ASSEMBLY

1. Construction



① Blade
② Developing cylinder
③ Stirring rod
④ Toner supply mouth
⑤ Feedscrews

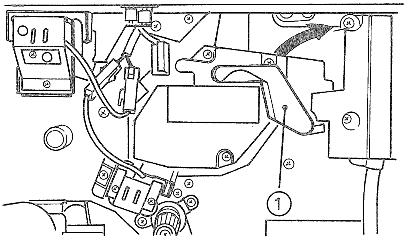
Figure 4-600

Note:

The copier's developing assembly is not equipped with a developing cylinder protection cover. As such, take care not to scar the developing cylinder when the developing assembly is detached.

2. Detaching the Developing Assembly

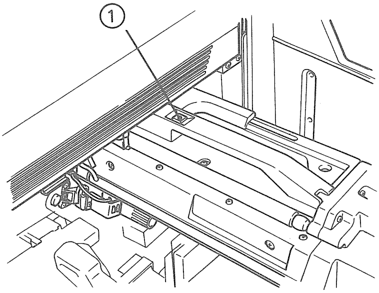
1) Detach the process cover.
2) Turn the release lever clockwise to release the developing assembly.



① Release lever

Figure 4-601

3) Slide out the developing assembly slowly until it stops.
4) Press the developing assembly release button, and slide out the developing assembly.



① Release button

Figure 4-602

3. Attaching the Developing Assembly

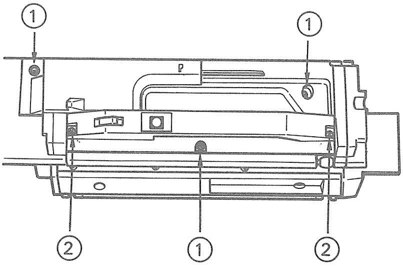
To attach the developing assembly, reverse the procedure used to detach it; take care so that the assembly will not hit other parts.

Note:

After attaching the developing assembly, make a copy; thereafter, check that the rolls on both ends of the assembly are in contact with the drum while the drive from the main motor is available at the assembly; if not in contact, the distance between the drum and developing cylinder will be too great, resulting in light images.

4. Detaching the Blade and Developing Cylinder

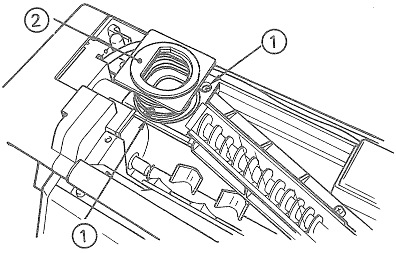
1) Detach the developing assembly from the copier.
2) Remove the five screws, and detach the upper cover.



① Screws (M4X8)
② Screws (M4X16)

Figure 4-603

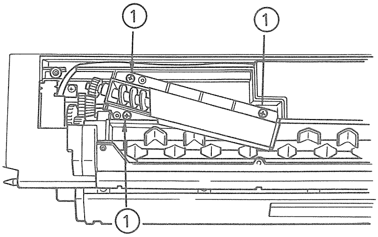
3) Remove the two screws, and detach the toner supply mouth.



① Screws
② Toner supply mouth

Figure 4-604

4) Remove the three screws, and detach the feedscrew unit.

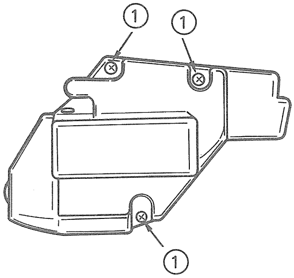


① Screws

Figure 4-605

5) Place a newspaper or waste paper on the floor, empty the developing assembly of toner.

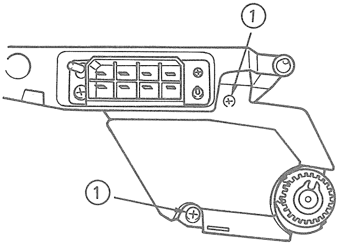
6) Remove the three screws, and detach the grip.



① Screws

Figure 4-606

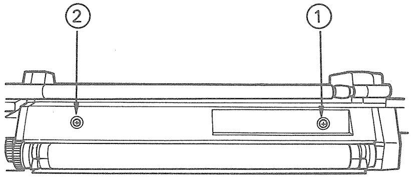
7) Remove the two screws, and detach the gear cover.



① Screws

Figure 4-607

8) Remove the non-magnetic stepped screw and non-magnetic screw, and detach the blade cover.

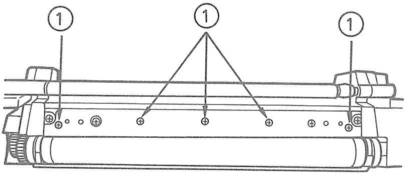


① Non-magnetic screw
② Non-magnetic stepped screw

Figure 4-608

9) Put copy paper between the blade and developing cylinder.

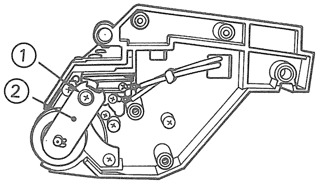
10) Remove the five non-magnetic screws, and detach the blade; at the time, take care so that the blade will not come into contact with the developing cylinder.



① Non-magnetic screws

Figure 4-609

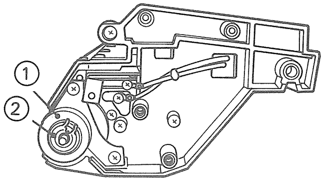
11) Mark the position of the magnetic fixing plate using a scriber; thereafter, remove the screw, and detach the magnetic fixing plate and the toothed washer.



① Screw
② Magnetic fixing plate

Figure 4-610

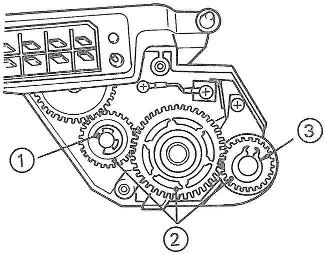
12) Remove the grip ring, and detach the roll.



① Roll
② Grip ring

Figure 4-611

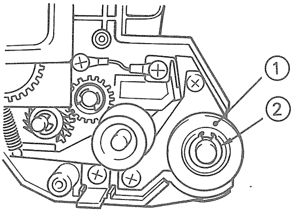
13) Remove the grip ring and E-ring, and detach the three gears; at the time, take care not to drop the pin.



① E-ring
② Gear
③ Grip stop ring

Figure 4-612

14) Remove the grip ring, and detach the roll.

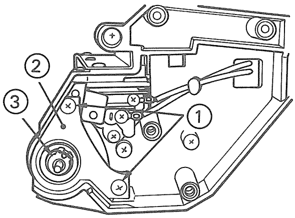


① Roll
② Grip ring

Figure 4-613

15) Remove the two screws, and detach the bushing plate (front).

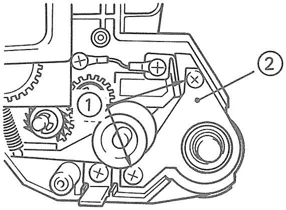
16) Remove the C-ring.



① Screws
② Bushing plate
③ C-ring

Figure 4-614

17) Remove the roll; thereafter, remove the two screws, and detach the bushing plate (rear).



① Screws
② Bushing plate

Figure 4-615

18) Detach the ball bearing from the front and rear while pushing the developing cylinder to the left and right.
19) Detach the developing cylinder.

Note:

Do not leave fingerprints or oil on the developing cylinder; otherwise, dry wipe it using lint-free paper.

If the image corresponding to the portion on the cylinder that has been wiped is too light, re-wipe the portion using lint-free paper moistened with a small amount of water. Do not use solvents.

5. Attaching the Side Seal

Figure 4-616 shows the side sea; attach it with the wider end at the top.

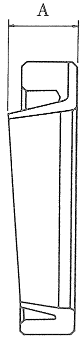


Figure 4-616

B. HOPPER UNIT

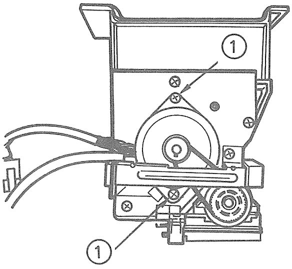
1. Detaching the Hopper Unit

1) Detach the developing assembly from the copier.

Note:

If the hopper is detached without detaching the developing assembly, the toner may fall out from the hopper.

2) Open the hopper upper cover.
3) Detach the toner supply mouth cover.
4) Disconnect the two connectors.
5) Detach the hopper from the copier.
6) Remove the two screws, and detach the motor unit.



① Screws

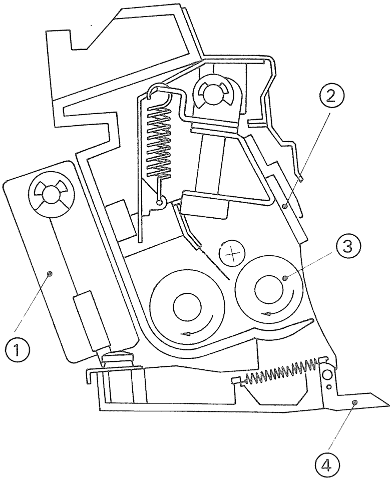
Figure 4-617

7) Detach the gear of the toner supply unit.

VII. CLEANING SYSTEM

A. DRUM CLEANING UNIT

1. Construction

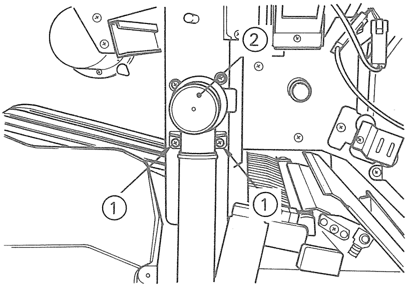


① Separation claw drive unit
② Cleaning blade
③ Magnet roller
④ Separation claw

Figure 4-700

2. Detaching the Drum Cleaning Unit from the Copier

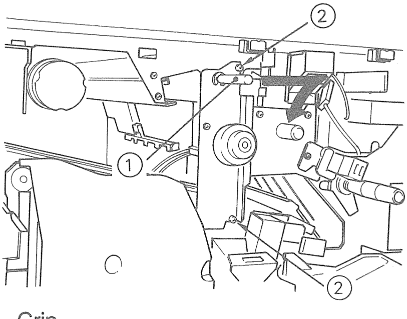
1) Open the front doors.
2) Detach the process cover.
3) Remove the two screws, and detach the waste toner pipe.



① Screws
② Waste toner pipe

Figure 4-701

4) Pull the cap to the front.
5) Loosen the two screws.
6) Slide out the grip of the cleaner to the front, and move the cleaner support shaft into the direction of the arrow in Figure 4-702.



① Grip
② Screws

Figure 4-702

7) Hold the grip of the cleaner, and slide it to the front to remove.

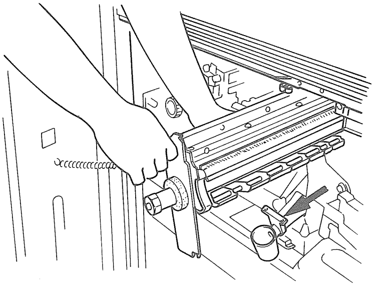


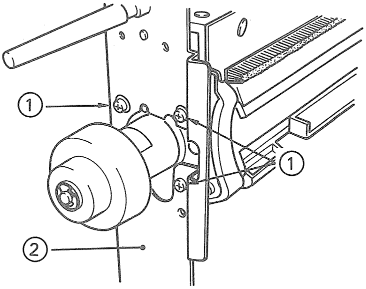
Figure 4-703

Note:

The cleaner does not have a stopper; take care not to drop it when sliding it out to the front.

Note:

Do not remove the three screws shown in Figure 4-704; the cleaner front plate is adjusted at the factory with high precision using a jig with reference to the physical relationship of the magnet roller and drum.

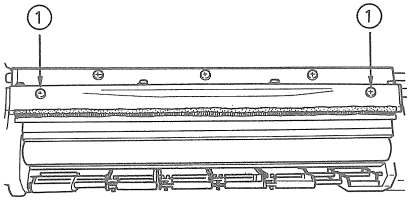


① Screws (DO NOT REMOVE)
② Cleaner front plate

Figure 4-704

3. Detaching the Cleaning Blade

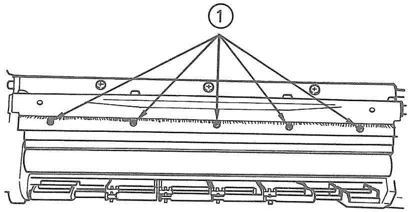
1) Detach the cleaning unit from the copier.
2) Remove the two screws, and detach the brush plate.



① Screws

Figure 4-705

3) Loosen the five screws, and detach the cleaning blade.



① Screws (M3×6)

Figure 4-706

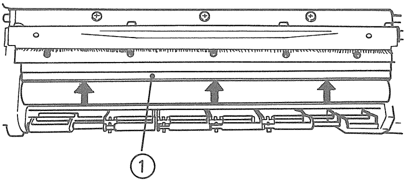
4. Attaching the Cleaning Blade

To attach the cleaning blade, reverse the order used to detach it.

Fix the cleaning blade while butting it against the rear by hand.

After attaching the cleaning blade, make sure that the edge of the blade is not conspicuously deformed.

Move the cleaning blade and check that its end is not in contact with the inner side of the side plate.

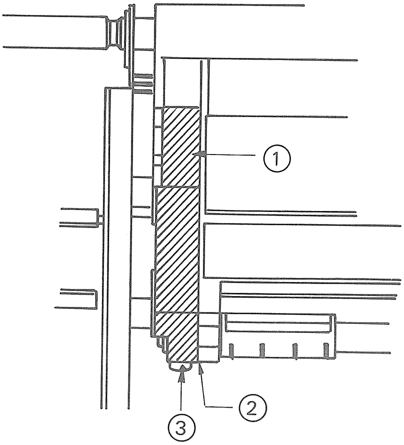


① Cleaning blade

Figure 4-707

5. Attaching the Side Seal

1) Remove the screw from the side seal attached to the cleaning unit, and detach the seal.
2) Clean the area to which the side seal was attached using solvent.
3) Remove the protective sheet from a new side seal, and attach it on the cleaning unit aligning it over the screw hole.
4) Fix the side seal in place using the mounting screw.

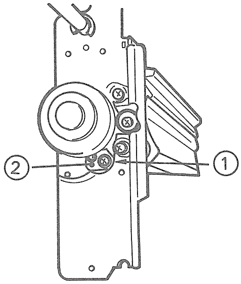


① Side seal
② Mounting screw
③ Attach it along the end.

Figure 4-708

6. Detaching the Separation Claw Unit

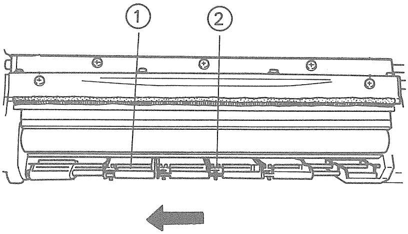
1) Detach the cleaning unit.
2) Peel the side seal from the front slowly starting at the top; do not remove it completely.
3) Remove the screw, and detach the fixing plate.



① Screw
② Fixing plate

Figure 4-709

4) Slide the rail of the separation claw to the front.



① Waste toner receptacle
② Separation claw unit

Figure 4-710

5) Detach the separation claw.

7. Cleaning the Magnet Roller

1) Detach the cleaning unit from the copier.
2) Detach the separation claw drive unit from the cleaning unit.
3) Detach the waste toner receptacle (front, rear).
4) Move the separation claw unit to the front, and detach it from the cleaning unit.
5) Turn the magnet roller in reverse of the arrow shown in Figure 4-700, and remove foreign matter from the roller; paper lint, in particular.

8. Cleaning the Cleaning Brush

Clean the cleaning brush using lint-free paper moistened with alcohol solution.

9. Cleaning the Rail for the Separation Claw

Dry wipe the rail if it is soiled.

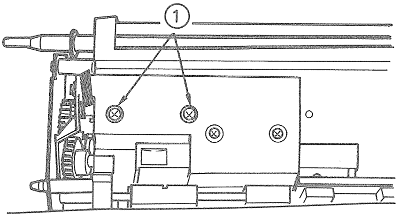
B. SEPARATION CLAW DRIVE UNIT

1. Detaching the Separation Claw Drive Unit from the Cleaning Unit

1) Detach the cleaning unit from the copier.
2) Remove the two screws, and detach the separation claw drive unit from the cleaning unit.

Note:

Take care not to break the separation claw.



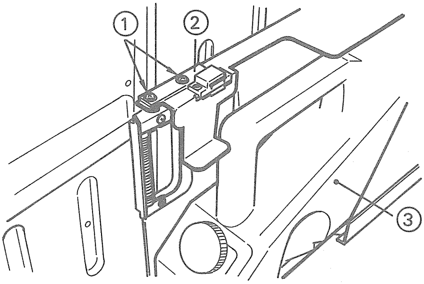
① Screws

Figure 4-711

C. WASTE TONER FEED UNIT

1. Detaching the Waste Toner Feed Motor

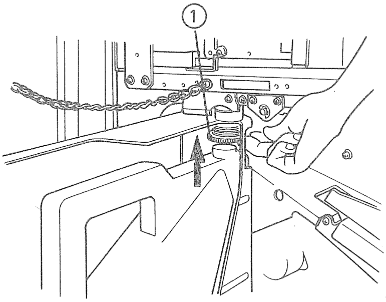
1) Detach the process cover, fixing assembly cover, and inside center cover.
2) Loosen the screws on the fixing plate.



① Screws
② Fixing plate
③ Waste toner receptacle

Figure 4-712

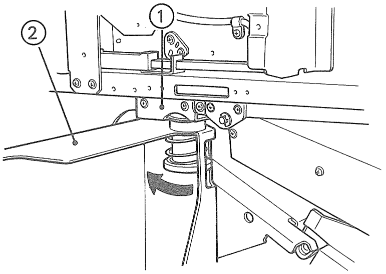
3) Pick and lift the ring, and detach the waste toner receptacle.



① Ring

Figure 4-713

4) Turn the ring clockwise, and remove it.
5) Detach the pipe fixing plate, and detach the waste toner receptacle mount.



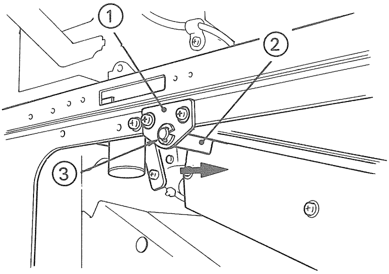
① Pipe fixing plate
② Waste toner receptacle mount

Figure 4-714

6) Remove the E-ring, and detach the shaft from the belt feed fixing plate.

Note:

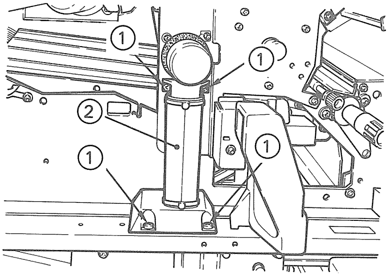
The belt feed fixing plate is adjusted at the factory; do not loosen or remove the screw.



① Belt feed fixing plate
② Shaft
③ E-ring

Figure 4-715

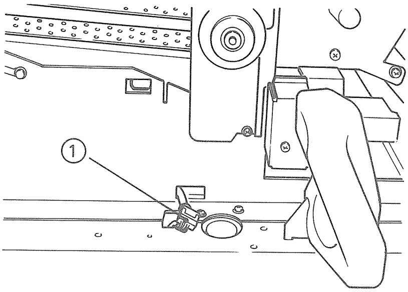
7) Remove the four screws, and detach the waste toner pipe.



① Screws
② Waste toner pipe

Figure 4-716

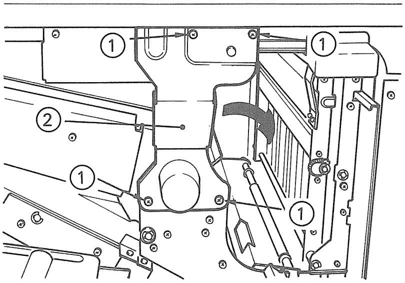
8) Disconnect the connector.



① Connector

Figure 4-717

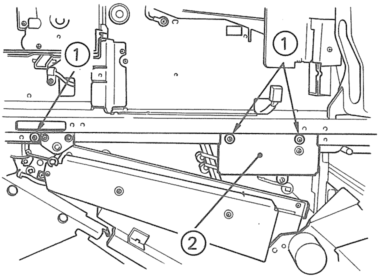
9) Remove the four screws, and detach the release lever support plate .



① Screw
② Release lever support plate

Figure 4-718

10) Remove the three screws, and detach the waste toner feed motor unit.

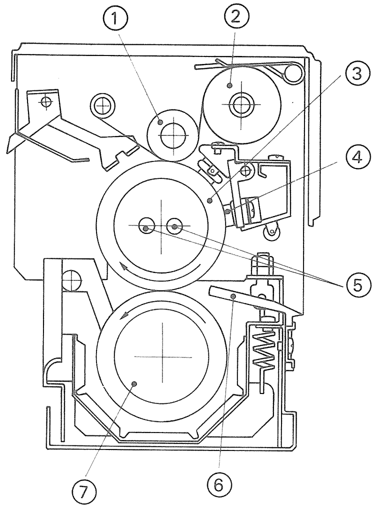


① Screws
② Waste toner feed motor unit

Figure 4-719

VIII. FIXING SYSTEM

A. FIXING ASSEMBLY



① Cleaning belt roller
② Cleaning belt
③ Upper roller
④ Thermistor
⑤ Heaters

Figure 4-800 Cross Section of Fixing Assembly

1. Pressurization Mechanism

The upper roller and lower roller come into contact under pressure when the pressure lever is moved in the direction of the arrow.

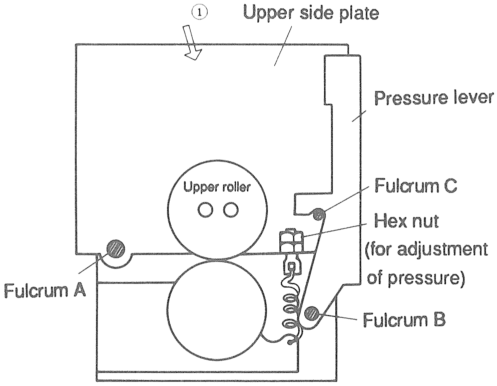
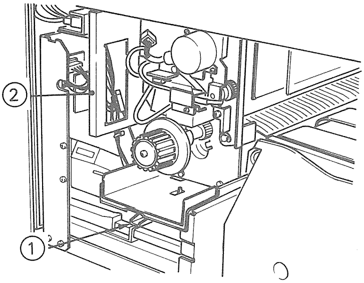

①
Upper side plate
Pressure lever
Upper roller
Fulcrum C
Hex nut
(for adjustment
of pressure)
Fulcrum A
Fulcrum B

Figure 4-801

2. Detaching the Fixing Assembly from the Copier

1) Open the front doors, and detach the fixing assembly cover.
2) Open the delivery assembly.
3) Release the fixing assembly stopper, lift the grip, and slide the fixing assembly to the front.



① Stopper
② Grip

Figure 4-802

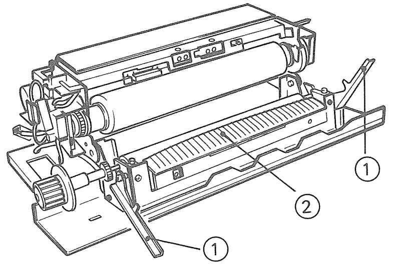
4) Lift the fixing assembly with both hands, and detach it from the copier.

Note:

Keep the delivery assembly open while detaching or attaching the fixing assembly.

3. Detaching the Lower Roller

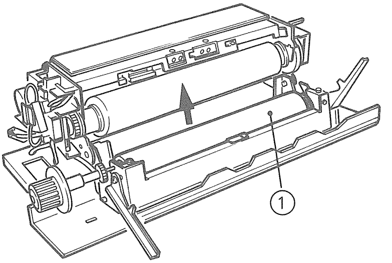
1) Slide out the fixing assembly.
2) Pull the pressure lever (front, rear) to release it, and open the upper roller unit; take care, as the weight shifts to the rear when the upper roller unit is opened.
3) Detach the paper guide plate.



① Pressure cover
② Paper guide plate

Figure 4-803

4) Lift the lower roller to detach.



① Lower roller

Figure 4-804

4. Attaching the Lower Roller

To attach the lower roller, reverse the procedure used to detach them; however, take care so that the thicker insulation collar shown in Figure 4-805 is to the front; see A in Figure 4-805.

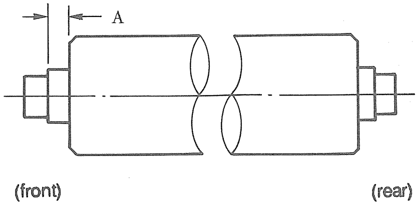
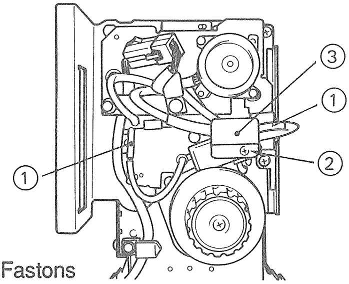


Figure 4-805

5. Detaching the Upper Heater and Upper Roller

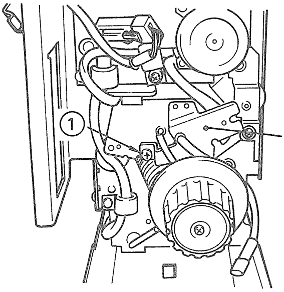
1) Slide out the fixing assembly from the copier.
2) Pull out the stop pin, and detach the fixing assembly upper cover.
3) Pull out the two fastons of the heater at the front.
4) Remove the screw, and detach the faston mount at the front.



① Fastons
② Screw
③ Faston mount

Figure 4-806

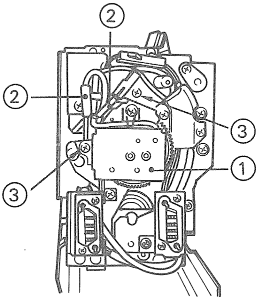
5) Remove the screw, and remove the main heater fixing plate.



① Screw
② Main heater fixing plate

Figure 4-807

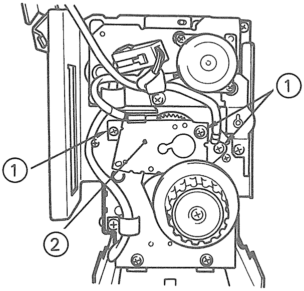
6) Pull out the two fastons of the heater at the rear.
7) Remove the three screws, and detach the heater mount at the rear.



① Heater mount
② Fastons
③ Screws

Figure 4-808

8) Remove the three screws, and detach the heater mount at the front.



① Screws
② Heater mount

Figure 4-809

9) Push the lock plate (front, rear) of the fixing cleaner to release it, and open the fixing assembly cleaning unit.
① Lock plates

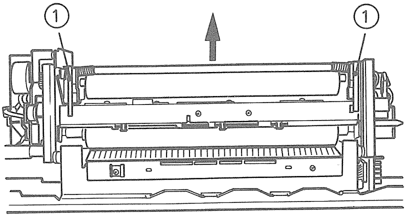
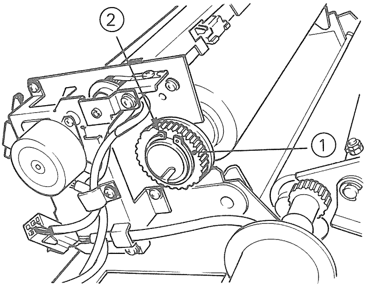


Figure 4-810

10) Shift the pressure lever to the front to release it, and open the upper roller unit.

11) Remove the C-ring, and detach the fixing roller gear.



① Fixing roller gear
② C-ring

Figure 4-811

12) Detach the stop fixing from the ball bearing.
① Stop fixing

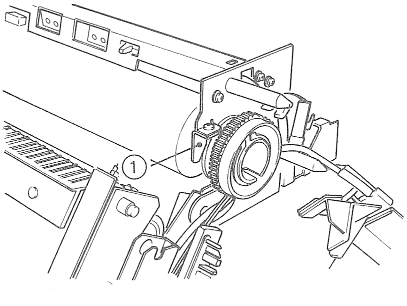


Figure 4-812

13) Detach the ball bearing at the front from the upper roller, and detach the upper roller while paying attention to the thermistor and thermal fuse.

6. Attaching the Upper Heater and Upper Roller

Attach the upper heater and upper roller by reversing the order used to attach them; take note of the following:

1. Handling the Upper Roller
   Wrap copy paper around the roller to protect it from dirt or scratches.
2. Orienting the Upper Roller
   Attach the upper roller so that its thicker insulating collar is to the rear; A of Figure 4-813.

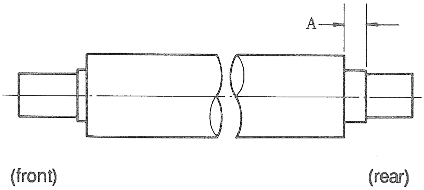
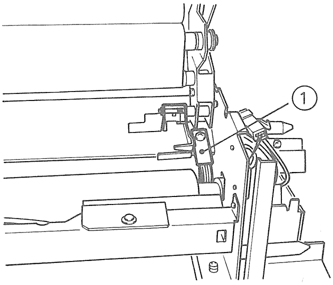


Figure 4-813

3. Replacing the Upper Roller
   Keep the static eliminating brush against the roller end as shown in Figure 4-814.



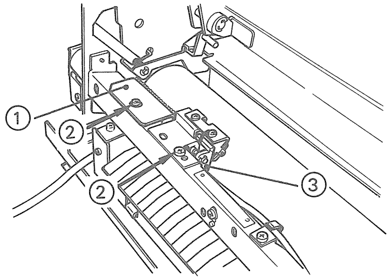
① Static eliminating brush

Figure 4-814

4. Attach the upper heater so that the print showing its manufacturer is to the front.

7. Detaching the Thermistor

1) Remove the screw, and detach the insulating cover.
2) Remove the screw, and detach the thermistor unit.



① Insulating cover
② Screw
③ Thermistor unit

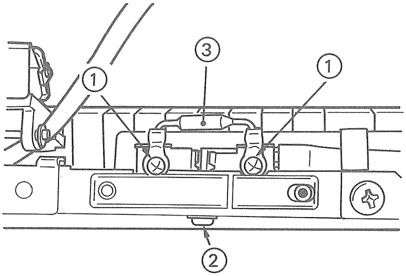
Figure 4-815

8. Positioning the Thermal Fuse

Use thermal fuses of the following ratings:

- for main heater side, 192°C, 15A; 226°C, 15A.
- for sub heater side, 192°C, 15A.

To replace the thermal fuse, remove screw A shown in Figure 4-816; replace the fuse only.



① Screw A
② Screw B
③ Thermal fuse

Figure 4-816

Do not remove screw B in the field; otherwise, attach it so that it is 4.5 ±0.5 mm away from the upper roller thermal fuse.

Note:

When attaching the thermal fuse, be sure to use a screw with a spring washer.

① Thermal fuse
② Screw B
③ Screw w/ spring washer

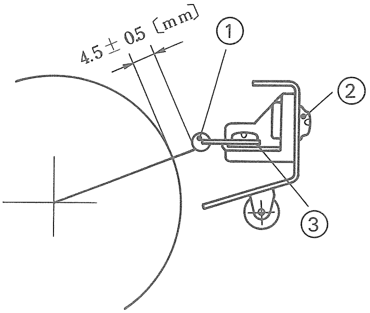


Figure 4-817

9. Adjusting the Nip Width (tightening the pressure adjusting hex nut)

If the nip width is as shown in Figure 4-818, no adjustment is necessary; otherwise, turn the hex nut with the pressure lever set.

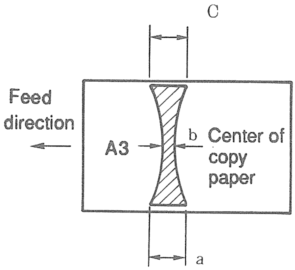

C
Feed direction
A3
b
Center of copy paper
a

Figure 4-818

Dimension	Measurements*
b	8.5 ±0.5 mm
|a–c|	0.5 mm or less

* Take measurements when both upper and lower rollers are adequately heated.

Table 4-800

Note:

If the rollers are cool, wait for 30 minutes after the WAIT indicator has gone OFF; take measurements after making 20 copies.

10. Positioning the Paper Guide

Position the paper guide so that it is as shown from the top face of the bottom plate of the fixing assembly; see Figure 4-819.

front: 73.3 ±0.5 mm
rear: 73.3 ±0.5 mm

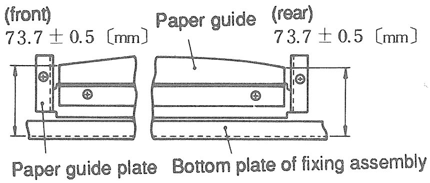

(front)
73.7 ± 0.5 〔mm〕
Paper guide
(rear)
73.7 ± 0.5 〔mm〕
Paper guide plate
Bottom plate of fixing assembly

Figure 4-819

11. Instruction for lubrication to the fixing unit drive stop clutch

When replacing parts in the fixing unit drive stop clutch in the field, apply lubricating oil. In particular, when replacing the sponge (FA6-4337-000) fully apply lubricating oil before insertion.

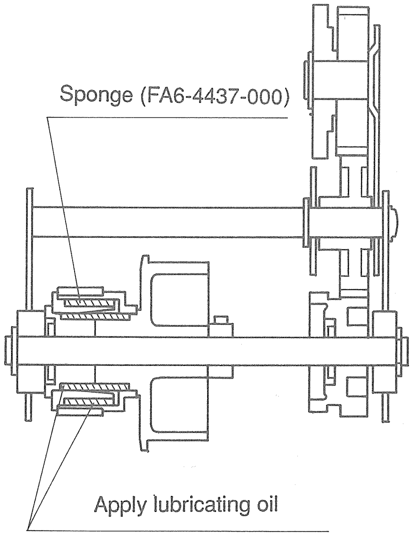

Sponge (FA6-4437-000)
Apply lubricating oil

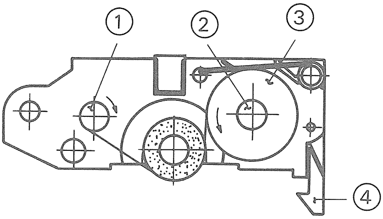
Figure 4-819A

B. FIXING ASSEMBLY CLEANING UNIT

1. Outline

The unit is part of the fixing assembly and is located at the top of the fixing assembly; a cleaning belt impregnated with silicone oil is put into contact with the upper roller to remove dirt from the upper roller.

The cleaning belt is 15 m in length; a red band is printed over a length of 2.5 m at its end.

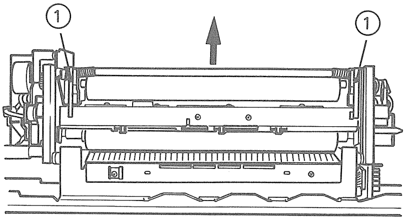


① Take-up shaft
② Feed shaft
③ Cleaning belt
④ Lock plate

Figure 4-820 Cross Section of the Fixing Assembly Cleaning Unit

2. Detaching the Cleaning Belt

1) Slide out the fixing assembly, and detach the fixing assembly cover.
2) Detach the lock plate from the front and rear of the fixing assembly cleaning unit, and open the fixing assembly cleaning unit as shown in Figure 4-821.



① Lock plates

Figure 4-821

3) Open the stop plate of the cleaning belt by hand; at the same time, detach the feed shaft and then the cleaning belt together with its shaft by pressing the shaft support unit at the rear by the take-up shaft as shown in Figure 4-822.

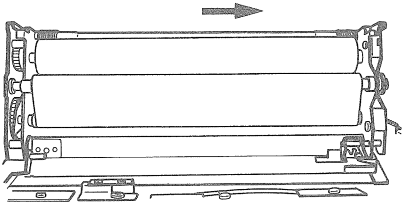


Figure 4-822

3. Attaching the Cleaning Belt

The feed shaft, take-up shaft, and cleaning belt are treated as a single unit; attach the cleaning belt by reversing the procedure used to detach it.

1. Release the cleaning belt lock claw, and take up the cleaning belt on the take-up shaft until the red band is no longer in view (about 30 cm); at the time, check that the portion in contact with the roller is impregnated with oil.

Note:

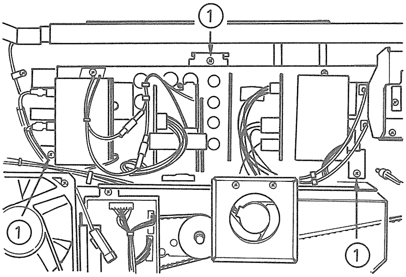
Check if the cleaning belt is not askew, slack, or wrinkled.

IX. ELECTRICAL

A. HIGH-VOLTAGE UNIT

1. Detaching the High-Voltage Unit

1) Remove the mounting screw of the grounding wire for the high-voltage unit, remove the three screws that fix the high-voltage unit mount in place, and detach the unit.



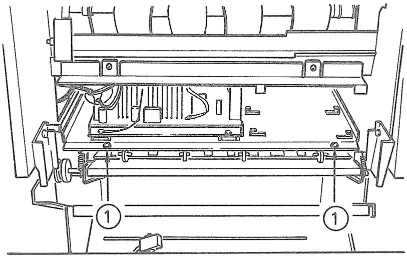
① Screws

Figure 4-900

B. 24V POWER SUPPLY PCB

1. Detaching the 24V Power Supply PCB

1) Detach the delivery/feeder assembly.
2) Detach the delivery assembly.
3) Remove the two screws, and slide out the power unit to the front.



① Screws

Figure 4-901

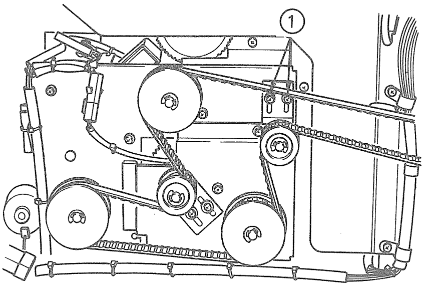
4) Disconnect all connectors from the power supply PCB.
5) Remove the two mounting screws of the power supply PCB, and detach the PCB.

X. DUPLEXING UNIT

A. DUPLEXING UNIT MOTOR

1. Detaching the Duplexing Unit Motor

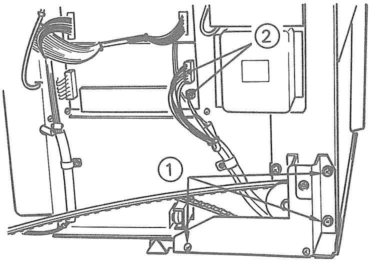
1) Detach the lower left cover and rear cover.
2) Loosen the two screws on idler plate 1, and detach drive belt 1.



① Screws

Figure 4-1000

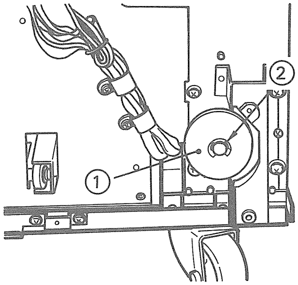
3) Disconnect the two connectors of the duplexing unit motor.
4) Remove the three screws, and detach the bracket.



① Screws
② Connector

Figure 4-1001

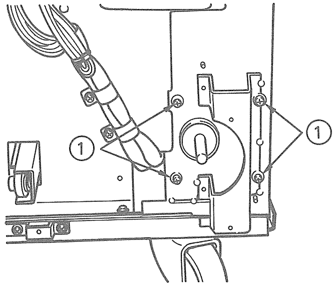
5) Remove the E-ring, and detach the pulley and parallel pin.



① Pulley
② E-ring

Figure 4-1002

6) Remove the four screws from the duplexing motor, and detach the duplexing motor.



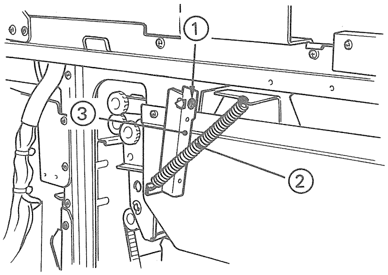
① Screws

Figure 4-1003

B. BELT FEED UNIT

1. Detaching the Belt Feed Unit

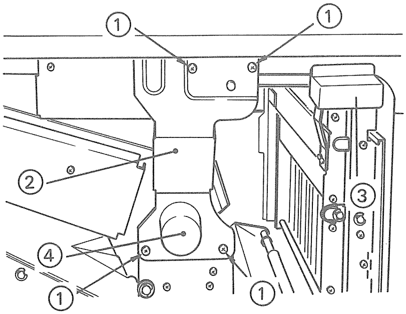
1) Detach the waste toner receptacle mount.
2) Detach the rear cover and inside rear cover.
3) Remove the spring and screw, and detach the spring hook plate.



① Screw
② Spring
③ Spring hook plate

Figure 4-1004

4) Remove the screw (M4X8), and detach the rotary knob.
5) Remove the four screws, and detach the release lever support plate.
6) Detach the release lever.



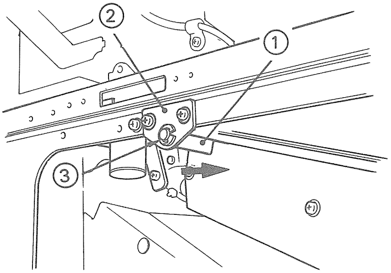
① Screws
② Release lever support plate
③ Release lever
④ Rotary knob

Figure 4-1005

7) Fix the vertical path unit in place using tape.
8) Remove the E-ring, and push the belt feed unit fixing shaft to the rear to remove.

Note:

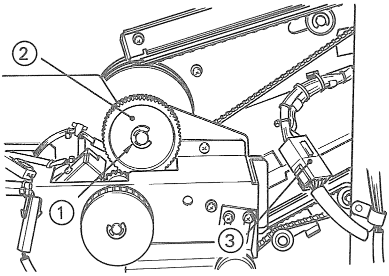
The belt feed unit fixing plate is adjusted in the factory; do not loosen or remove the mounting screws.



① E-ring
② Belt feed unit fixing plate
③ Shaft

Figure 4-1006

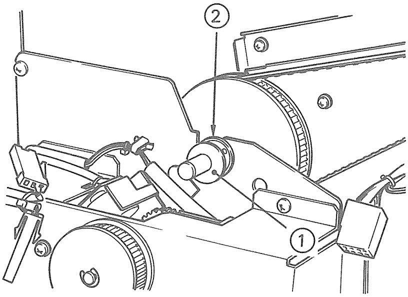
9) Disconnect the connector.
10) Remove the E-ring, and detach the belt feed gear and parallel pin.



① E-ring
② Gear
③ Connector

Figure 4-1007

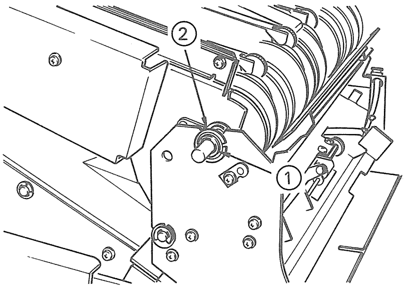
11) Detach the thrust stopper and bushing



① Thrust stopper
② Bushing

Figure 4-1008

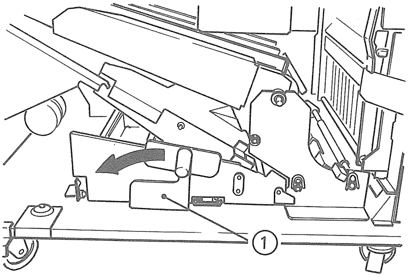
12) Remove the E-ring, and detach the bushing.



① E-ring
② Bushing

Figure 4-1009

13) Turn the lower lever clockwise, and lower the holding tray.

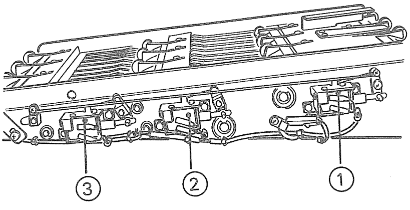


① Lower lever

Figure 4-1010

14) Detach the belt feed unit.

2. Detaching the Deflector Solenoid

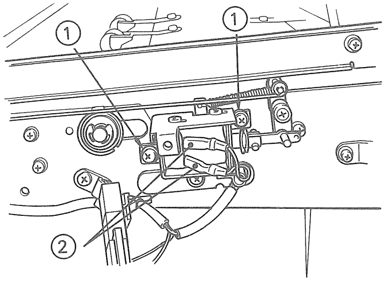


① Deflector solenoid L
② Deflector solenoid S
③ Deflector solenoid M

Figure 4-1011

Deflector solenoids L, M, and S can be detached in the same way; deflector L, therefore, will be used as an example.

1) Pull out the fastons, remove the two mounting screws for the solenoid, and detach the solenoid (SL1).

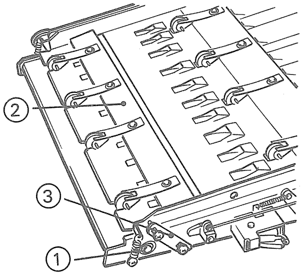


① Screws
② Fastons

Figure 4-1012

3. Detaching the Belt

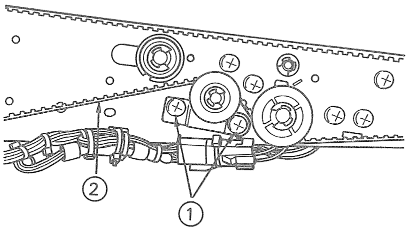
1) Detach the belt feed unit.
2) Remove the three mounting screws, and detach the cover.
3) Detach the link (front, rear), remove the two springs, and detach the upper guide plate.



① Spring
② Link
③ Upper guide plate

Figure 4-1013

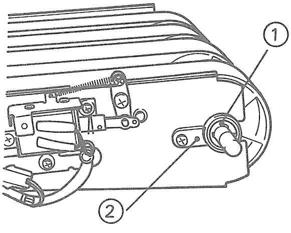
4) Loosen the two screws on the tension pulley, and detach the drive belt.



① Screws
② Drive belt

Figure 4-1014

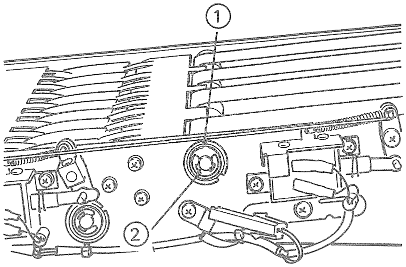
5) Remove the E-ring, detach the bushing stop plate, and detach the bushing.



① E-ring
② Bushing stop plate

Figure 4-1015

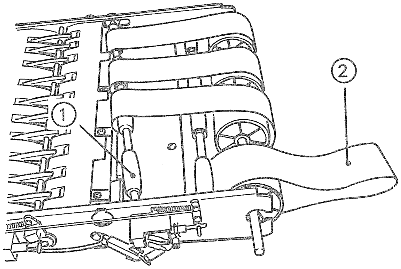
6) Remove the E-ring, and detach the bushing.



① Bushing
② E-ring

Figure 4-1016

7) Move the pulley shaft to the rear, and detach the belt.

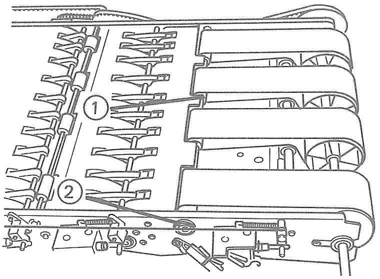


① Pulley shaft
② Belt

Figure 4-1017

4. Detaching the Duplexing Unit Delivery Sensor

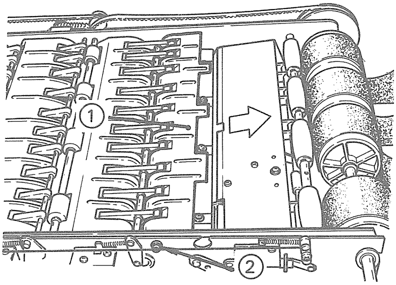
1) Detach the belt feed unit.
2) Detach the upper guide plate.
3) Remove the E-ring from the roller shaft, detach the bushing, and detach the roller shaft.



① Roller shaft
② Bushing

Figure 4-1018

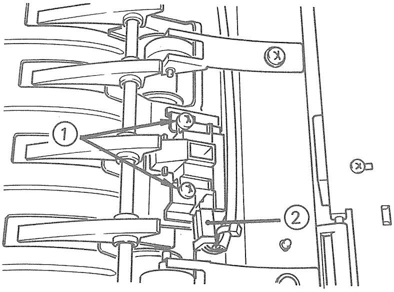
4) Remove the two screws from the fixing guide plate, and move the fixing guide plate to the right.



① Fixing guide
② Screw

Figure 4-1019

5) Disconnect the connector from the sensor, remove the two screws, and detach the sensor.



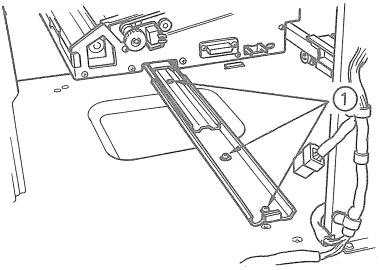
① Screws
② Connector

Figure 4-1020

C. HOLDING TRAY UNIT

1. Detaching the Holding Tray Unit

1) Remove the three screws that fix the rail in place, and detach the holding tray unit.

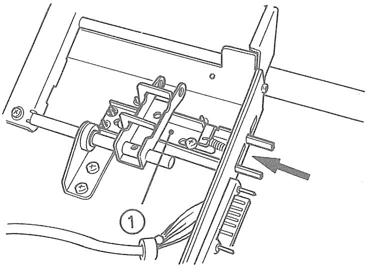


① Screws

Figure 4-1021

Note:

The holding tray unit is equipped with a stopper so that it cannot be lifted when it is slid out to the front. To lift the tray, slide it out, push in the stopper, and turn the release lever.



① Stopper

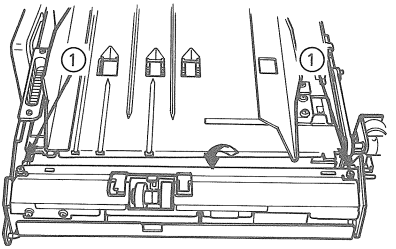
Figure 4-1022

Note:

Further, push in the stopper when lowering the holding tray; otherwise, the stopper will be deformed.

2. Detaching the Separation Roller

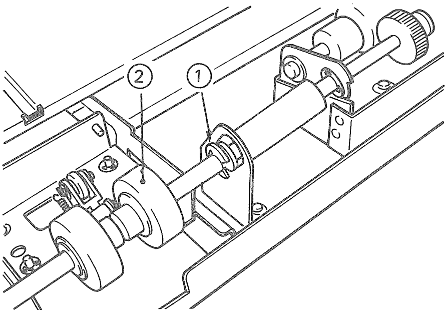
1) Slide out the holding tray.
2) Remove the two screws, and open the paper guide plate.



① Screws

Figure 4-1023

3) Remove the stop ring at the rear, and detach the separation roller.

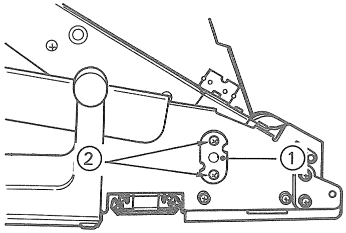


① Stop ring
② Separation roller

Figure 4-1024

3. Detaching the Tray Motor

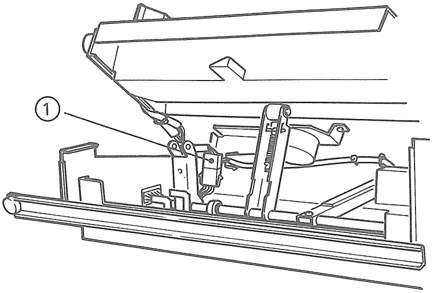
1) Slide out the holding tray unit.
2) Push in the stopper, and lift the holding tray.
3) Remove the two screws, and detach the positioning plate.



① Positioning plate
② Screws

Figure 4-1025

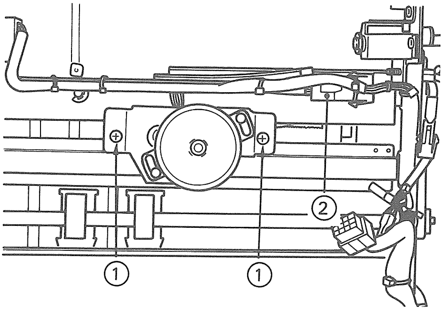
4) Disconnect the connector, and detach the holding tray.



① Connector

Figure 4-1026

5) Disconnect the connector.
6) Remove the two screws, and detach the tray motor.

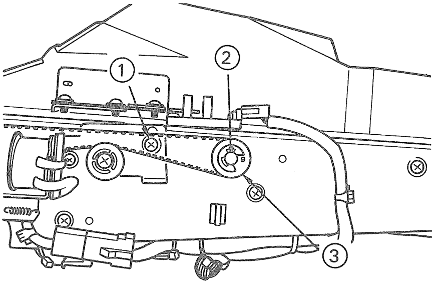


① Screws
② Connector

Figure 4-1027

4. Detaching the Auxiliary Feed Roller

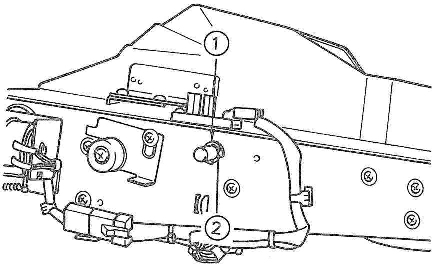
1) Loosen the mounting screw on the tension adjusting plate, and detach the tray belt.
2) Remove the E-ring, and detach the pulley; take care not to drop the pin.



① Screw
② E-ring
③ Pulley

Figure 4-1028

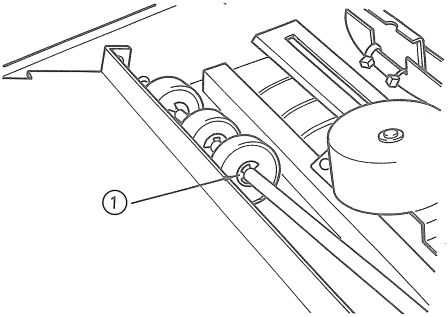
3) Remove the E-ring, and detach the auxiliary feed roller and parallel pin.



① E-ring
② Bushing

Figure 4-1029

4) Remove the E-ring, and detach the auxiliary feed roller and parallel pin.

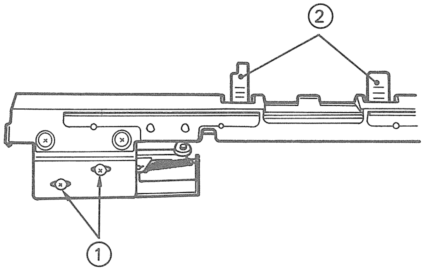


① E-ring

Figure 4-1030

5. Positioning the Paper Stopper Plate Solenoid

Attach the solenoid so that the paper stopper plate butts against the lower guide plate when the plunger is pulled.



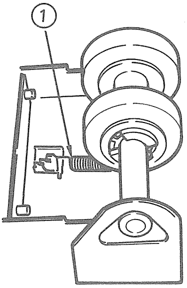
① Screw
② Paper stopper plate

Figure 4-1031

6. Positioning the Duplexing Unit Separation Roller

When feeding paper using the duplexing unit or if double-feeding or pick-up failure occurs, detach the holding tray, and adjust the position of the pressure spring.

i. If pick-up failure occurs, move the spring of the pressure mount to the left by one level, thereby expanding the spring.
ii. If double-feeding occurs, move the spring of the pressure mount to the right, thereby contracting the spring.



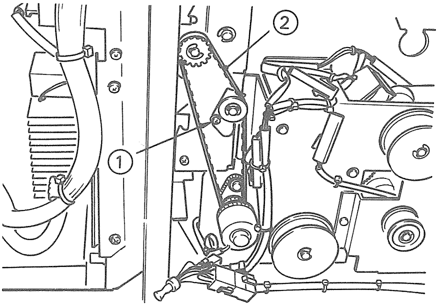
① Spring

Figure 4-1032

D. PICK-UP UNIT

1. Detaching the Pick-Up Unit

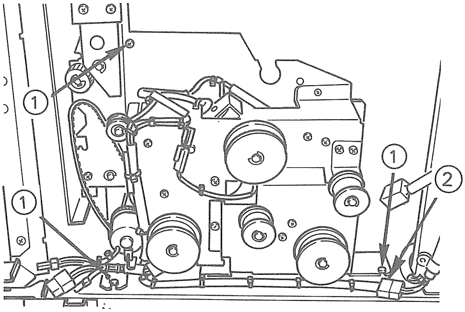
1) Detach the belt feed unit.
2) Detach the holding tray unit.
3) Loosen the screw on the tension pulley plate, and detach the belt.



① Screw
② Belt

Figure 4-1033

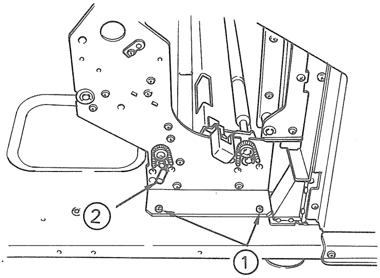
4) Disconnect the connector.
5) Remove the three screws.



① Screws
② Connector

Figure 4-1034

6) Remove the screw, and detach the grip of the feed roller.
7) Remove the two screws, and detach the pick-up unit.

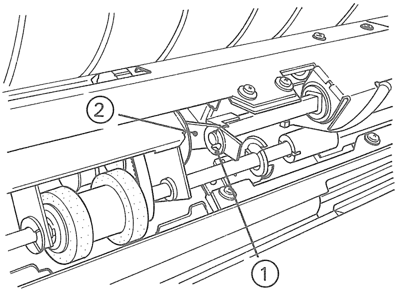


① Screws
② Grip

Figure 4-1035

2. Detaching the Pick-Up Roller Unit

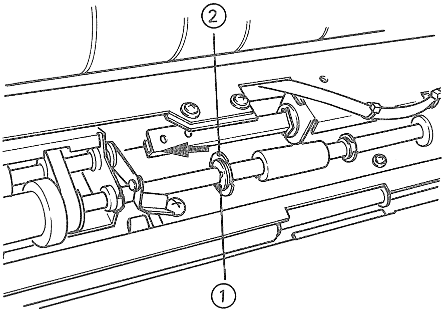
1) Turn the pick-up roller induction drive shaft until the stop ring comes into view.
2) Remove the stop ring, and detach the induction arm.



① Stop ring
② Induction arm

Figure 4-1036

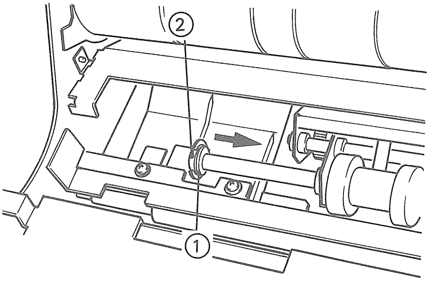
3) Detach the stop ring at the rear, and move the bushing toward the inside.



① Stop ring
② Bushing

Figure 4-1037

4) Detach the stop ring at the front, and move the bushing toward the inside.



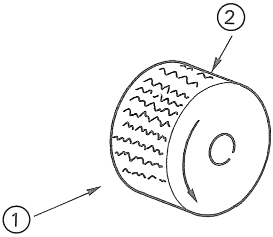
① Stop ring
② Bushing

Figure 4-1038

5) Detach the pick-up roller unit.

3. Orientation of the Separation and Feed Rollers

Attach the separation and feed rollers so that they are oriented as shown in Figure 4-1039.



① Smooth (shiny)
② Coarse

Figure 4-1039

An arrow is printed on the feed roller as shown in Figure 4-1040.

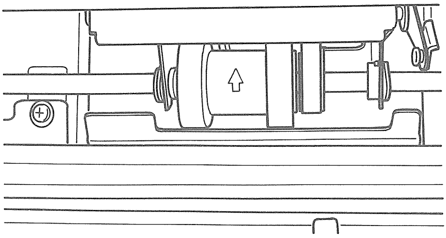
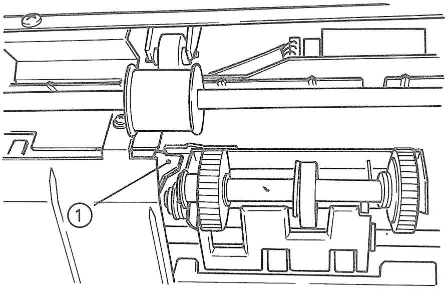


Figure 4-1040

4. Points to Note When Attaching the Pick-Up Roller Unit

Attach the pick-up roller unit so that its frame is above the release arm.

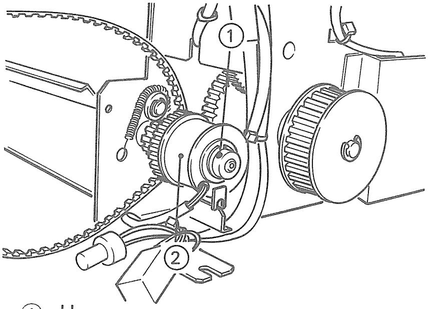


① Release arm

Figure 4-1041

5. Detaching the Drive Unit

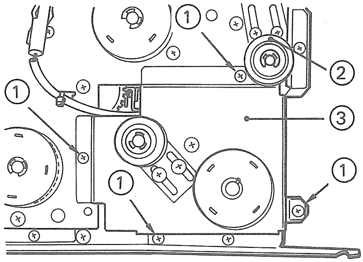
1) Remove the two stop hex screws, and detach the duplexing unit feed clutch.



① Hex screw
② Duplexing unit feed clutch

Figure 4-1042

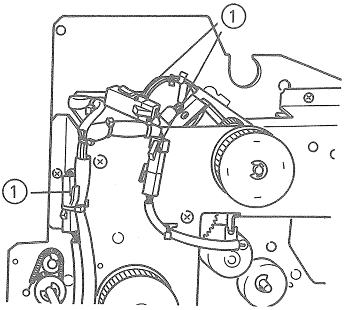
2) Detach the tension pulley plate.
3) Remove the four screws, and detach the pulley plate.



① Screws
② Tension pulley plate
③ Pulley plate

Figure 4-1043

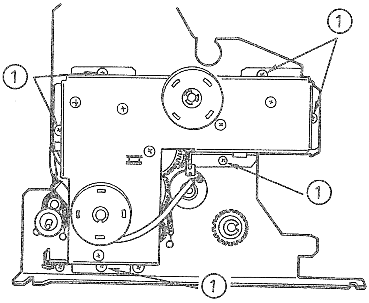
4) Disconnect the three connectors.
5) Cut the tie-wrap that fixes the harness in place, and keep the harness from the drive unit.



① Connectors

Figure 4-1044

5) Remove the six screws, and detach the drive unit.

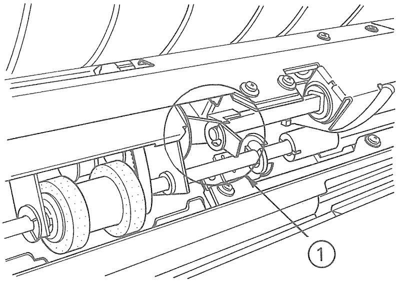


① Screws

Figure 4-1045

6. Attaching the Drive Unit

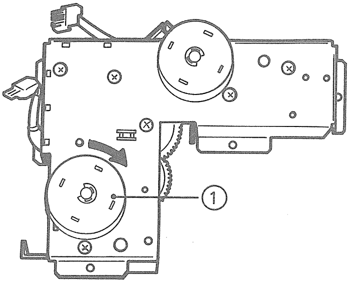
1) Position the pick-up roller arm and drive shaft so that they are parallel to each other.



① Parallel.

Figure 4-1046

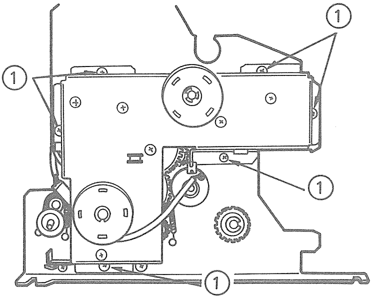
2) Turn the drive pulley clockwise, and bring the boss on the control ring of the induction solenoid unit into contact with the solenoid plate.



① Pulley

Figure 4-1047

3) Attach the drive unit to the pick-up unit keeping them as described in step 2).



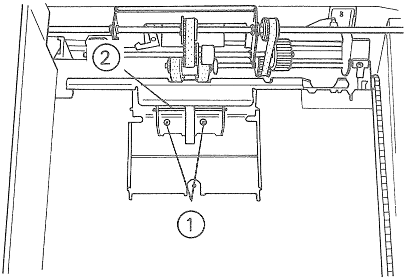
① Screws

Figure 4-1048

4) Attach the duplexing unit feed clutch.
5) Attach the pulley plate.
6) Attach the tension pulley plate.

A. DETACHING THE SEPARATION ROLLER

1) Detach the blind plate from the paper deck.
2) Remove the two screws, and detach the separation roller.



① Screws
② Sepration roller

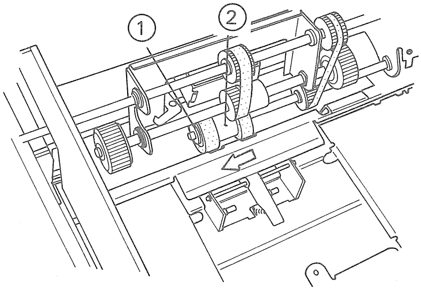
Figure 4-1100

Note:

Attach the separation roller while moving it as much as possible to the right.

B. DETACHING THE FEED ROLLER

1) Remove the stop ring.
2) Hold the separation roller, and detach the feed roller while sliding it to the left.



① Stop ring
② Feed roller

Figure 4-1101

C. POSITIONING THE DOOR SWITCH

Adjust the position of the microswitch mount so that the microswitch (PMS2) is actuated without fail when the paper door is closed.

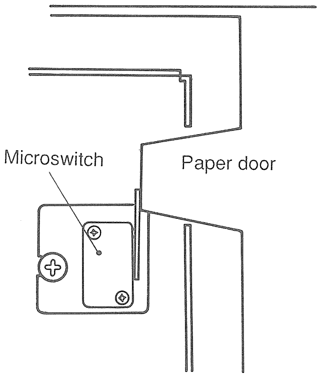

Microswitch
Paper door

Figure 4-1102

D. POSITIONING THE LIFTER POSITION SENSOR (PI2)

1) Open the paper cover, and set a sheet of copy paper on the lifter.
2) Insert the door switch actuator (TKN-0093) into the door switch unit.
3) Adjust the position sensor so that the distance between the lifter and the pick-up drive shaft is 13 +1, -0.5 mm when the lifter has stopped to move up.

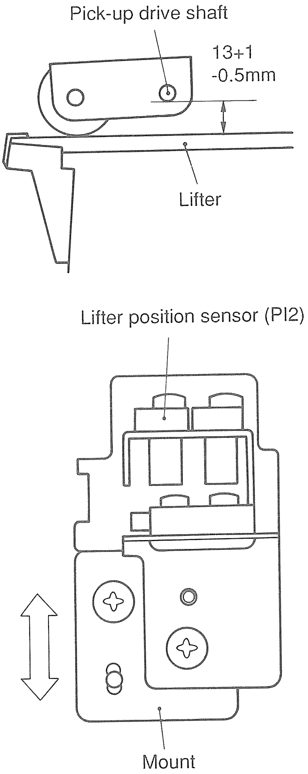

Pick-up drive shaft
13+1
-0.5mm
Lifter
Lifter position sensor (PI2)
Mount

Figure 4-1103

E. POSITIONING THE UPPER LIMITER SWITCH (PMS4)

1) Adjust the lifter position sensor (PI2).
2) Adjust the upper lifter switch mount by moving it to the left and right so that the upper limiter switch is actuated when the sensor arm is moved up by hand until it stops.

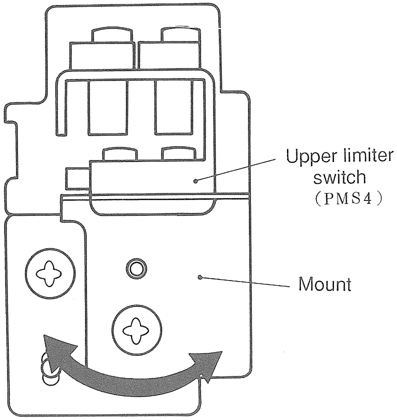

Upper limiter switch (PMS4)
Mount

Figure 4-1104

F. POSITIONING THE RETENTION SOLENOID

Position the retention solenoid so that the gap between the brake plate and the stopper claw is 1.5 ±0.5 mm when the stopper claw is pushed by a finger.

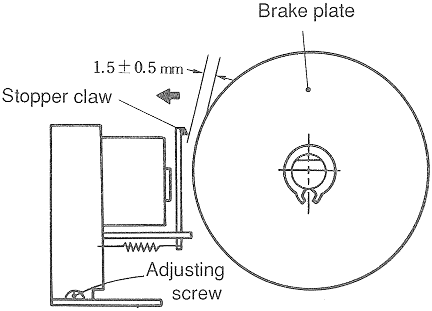

Brake plate
1.5 ± 0.5 mm
Stopper claw
Adjusting screw

Figure 4-1105

G. POSITIONING THE CLUTCH MOUNT

Attach the clutch mount so that the pick-up drive shaft is centered in the hole.

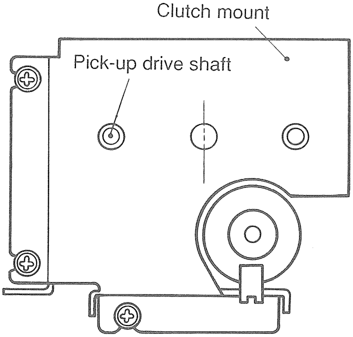

Clutch mount
Pick-up drive shaft

Figure 4-1106

H. POSITIONING THE PULLEY

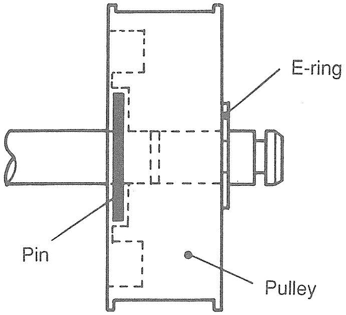

E-ring
Pin
Pulley

Figure 4-1108

CHAPTER 5

INSTALLATION

The copier is carefully adjusted and strictly inspected before it leaves the factory and, therefore, proper installation is very important in maintaining its out-of-factory performance. Make sure that all the conditions discussed in this chapter are satisfied before installation, and carry out all necessary inspections after installation.

I. CHOOSING THE LOCATION 5-1

II. UNPACKING AND INSTALLATION 5-3

III. RELOCATING THE COPIER.............5-11

IV. INSTALLING CONTROL CARD V 5-12

V. REPLACING THE POWER PLUG UNIT 5-14

I. CHOOSING THE LOCATION

The location of the copier should be chosen based on the following considerations. If possible, make a visit to the user for a study of the site before delivery of the copier.

1. The power supply should be connected to an outlet capable of supplying the voltage (±10%) and power shown on the rating plate.
2. The ambient temperature should be between 15°C and 30°C and the humidity, 5% to 80%. Avoid locations near water faucets, humidifiers, water boilers, and refrigerators.
3. Avoid locations near fire or subject to dust or ammonia fumes and direct rays of the sun. Provide curtains over the windows if necessary.
4. Make sure all feet of the copier will be in contact with the floor.
5. Allow at least 18 cm from any wall to provide access.
   The copier will be difficult to move for servicing; try to allow as much space as possible.

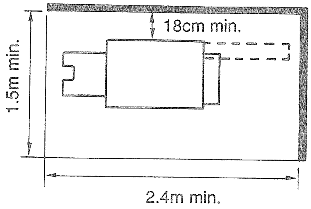


Figure 5-1

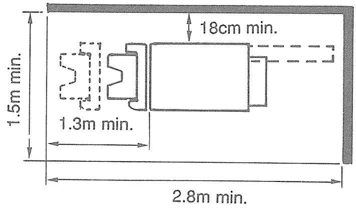


Figure 5-2 One - Sorter Configuration

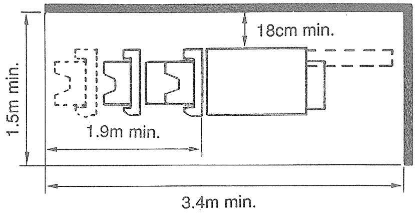


Figure 5-3 Two - Sorter Configuration

6. Choose a well-ventilated location.
   If other copiers are used in the same room, arrange the machine so that the exhaust from other copiers will not affect it.

The silicone gas* tends to soil the corona wires, shortening their lives; this is particularly true of low-humidity environments.

*Gases of silicone oil occurring in the fixing assembly.

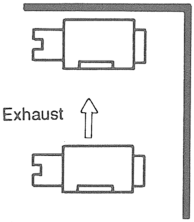


Figure 5-4

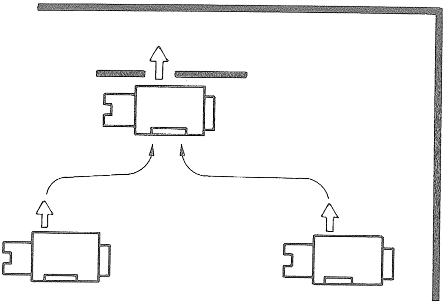
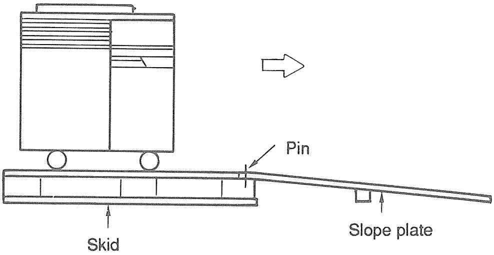


Figure 5-5

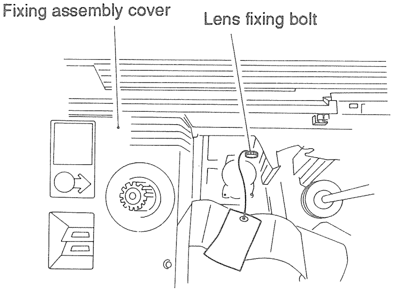
II. UNPACKING AND INSTALLATION

When a piece of metal is moved from a cold to a warm place, droplets of water form on its surface. This phenomenon is known as condensation and affects the performance of copiers. The simplest way to eliminate condensation in the copier, any copiers for that matter, is to leave it alone until it warms to room temperature (at least one hour).

A. UNPACKING

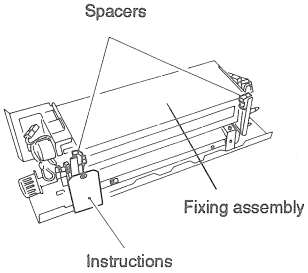
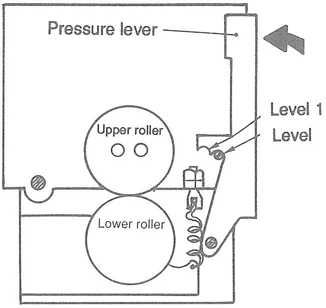
Step	Work	Checks/Remarks
1	Open the shipping carton containing the copier.	
2	Lift the pick-up unit side of the copier, and detach the two bottom pads.	Work in a group of two when lifting it.
3	Lift the delivery unit side of the copier, and detach the two bottom pads.	Work in a group of two when lifting it.
4	Take out the two slope plates from inside the skid (middle).	
5	Turn over the slope plates, align the pin holes in the skid with the pin holes in the slope plates, and fit them together using pins; the pins are taped to the cardboard box containing the bottom pads. Push the copier slowly along the slope plates.	
6	Open the cardboard box, and take out the contents.	Check that the following are available: • Photosensitive drum • OPERATOR'S MANUAL • Toner • Copy tray • Cassette • Copy tray holder • Paper cover for paper deck • Cover support plate for paper deck • Screw

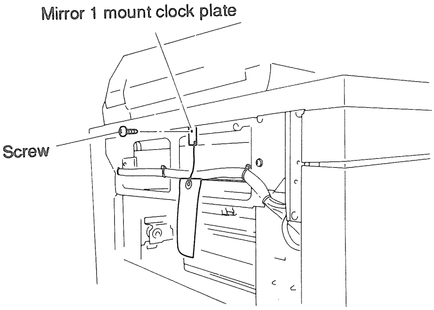
B. SETTING THE PHOTOSENSITIVE DRUM

Step	Work	Checks/Remarks
1	Open the front door, and release the delivery unit.	
2	Remove the jam indication unit, and detach the process unit cover.	
3	Release the developing assembly, and detach it from the copier.	• Check that the developing cylinder is free of dirt. • Take care not to damage the developing cylinder; the cover has been removed.
4	Remove the primary corona assembly, pre-transfer corona assembly, and transfer/separation corona assembly.	
5	Release the cleaning unit, and remove it from the copier.	
6	Remove the drum positioning plate.	
7	Put a hand above the feeder unit, and remove the bolt that fixes the lens in place.	
8	Take out the photosensitive drum from the box, and check the drum sensitivity printed on it.	The drum sensitivity is printed on the seal found behind the front door and inner side of the photosensitive drum as reference for a check in the service mode later.
9	Dry wipe the photosensitive drum, and attach the protective sheet on it.	Take extra care when working so as not to damage the drum.
10	Set the photosensitive drum in the copier.	
11	Detach the protective sheet from the photosensitive drum.	

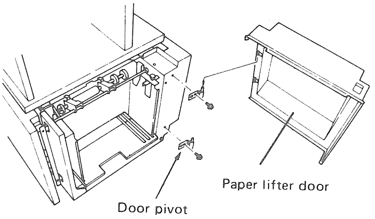
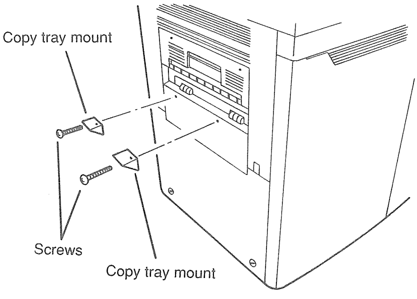
Step	Work	Checks/Remarks
12	Attach the drum positioning plate.	
13	Spread the toner from above the magnet roller to the cleaning blade, and set the cleaning unit in the copier.	
14	Clean the primary corona assembly, pre-transfer corona assembly, and transfer/ separation corona assembly; and set them in the copier.	◦ Use an alcohol solution. ◦ Connect the connectors of each corona assembly.
15	Set the developing assembly in the copier.	Take care so that the harness of the pre-transfer corona assembly will not come into contact with the developing cylinder.
16	Attach the process unit cover.	
17	Set the feeder assembly.	

C. SETTING THE FIXING ASSEMBLY AND SCANNER

Step	Work	Checks/Remarks
1	Open the delivery unit.	
2	Detach the fixing assembly cover, and remove the fixing assembly.	
3	Detach the spacers (front, rear) from the pressure lever of the fixing assembly. Set the pressure lever of the fixing assembly to level 2. (The lever is set to level 1 upon shipment from the factory.)	 Spacers Fixing assembly Instructions  Pressure lever Level 1 Level Upper roller Lower roller
4	Set the fixing assembly.	
5	Attach the fixing assembly cover.	

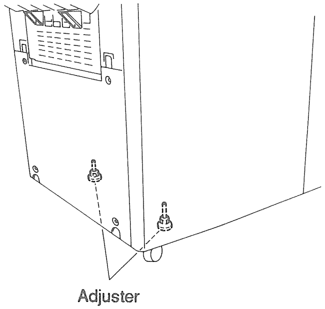
Step	Work	Checks/Remarks
6	Detach the upper left cover, and detach the mirror 1 mount lock plate.	 Mirror 1 mount clock plate Screw
7	Attach the upper left cover.	
8	Close the delivery assembly.	

D. SWITCHING THE COPIER ON

Step	Work	Checks/Remarks
1	Connect the power plug to the outlet, and switch the copier ON with the front door closed.	• Check that the ADD PAPER and SET CASSETTE messages go ON. • Press the keys on the input keypad and CLEAR key to check that the copy count is correct.
2	Attach the cover to the paper deck.	
3	Set copy paper in the paper deck, and close the paper cover.	• Check that the lifter moves up.
4	Put copy paper in the cassette, and set the cassette in the copier.	
5	Put toner (1 bottle) into the hopper unit.	• Check that the ADD TONER message goes OFF.
6	Attach the copy tray mount using a screw; if a sorter is to be used, skip this step.	

Step	Work	Checks/Remarks
7	Set the copy tray to the copier.	
8	Open the front door, and insert the door switch actuator into the door switch unit; then, switch the copier ON.	
9	Wait until the WAIT indicator goes OFF, and push SW605 on the switch/VR PCB. • Check the drum sensitivity using ⧆ 3 ⧆ SV-02 of the service mode. • Supply toner using ⧆ 4 ⧆ SS-0 of the service mode.	The copier operates for about six minutes to move toner from the hopper unit to the developing assembly. Do not switch the copier OFF or remove the door switch actuator while the copier is operating.

E. CHECKING THE COPY IMAGES/OPERATIONS AND SETTING THE USER MODES

Step	Work	Checks/Remarks
1	Place the Test Sheet on the copyboard, make copies, and check the copy images.	• Make sure no abnormal noise is heard. • Check the image quality of copies made at each of the available reproduction ratios. • Check that the specified number of copies are made without a problem.
2	Set the Test Sheet in the RDF, select the "two-sided original to two-sided copy" mode, and make copies.	• Make sure no abnormal noise is heard. • Check that the duplexing unit and RDF feed copy paper without a problem.
3	Make copies using the manual feed tray.	• Check that the copy operation is normal.
4	Set the standard modes as desired by the user; ✳ 5 ✳ in the service mode.	See the descriptions on the service mode.
5	Pull out the door switch actuator, and attach the jam indicator unit.	
6	Clean the area around the copier.	
7	Move the copier to the designated place; turn the adjuster to fix the machine in place.	• Check that the copier is more or less level. 
8	Fill out the Service Sheet.	

Note:

Keep the lens and mirror 1 mount lock plates for possible future relocation of the copier.

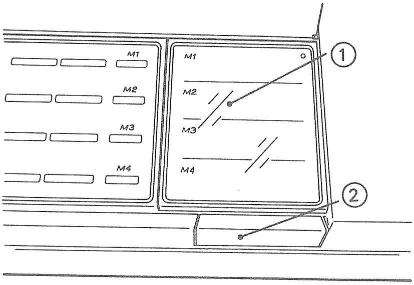
III. RELOCATING THE COPIER

Perform the following work before moving the copier by truck or other means of transportation.

Step	Work	Checks	Remarks
1	Make a copy in DIRECT.		
2	Remove all copy paper from the cassette.		
3	Switch the copier OFF, and disconnect the power plug from the power outlet.		
4	Fix the lens in place using a bolt.	Check that the lens will not shift.	
5	Detach the upper left cover, and fix the mirror 1 mount using the lock plate.	Check that the mirror 1 mount will not shift.	
6	Attach the upper left cover.		
7	Remove the photosensitive drum.	Transport the photosensitive drum separately from the coying machine.	
8	Attach the drum positioning plate, and set each corona assembly and developing assembly, cleaning unit, and feeder assembly.		
9	Tape the transfer corona assembly, feeder assembly release lever, developing assembly release lever, and duplexing unit release lever in place so that they will not shift in transit.		
10	Tape the front door, delivery assembly cover, hopper unit cover, and pick-up unit paper guide plate in place.		
11	Place a sheet of 11" x 17" paper on the copyboard glass, and tape the RDF.		

IV. INSTALLING CONTROL CARD V

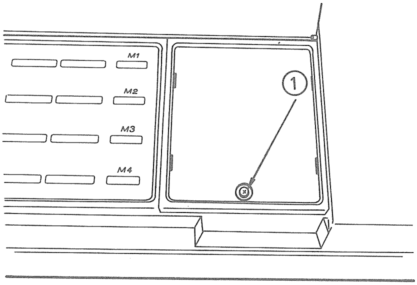
1) Detach the right cover.
2) Detach the front upper cover.
3) Detach the control panel.
4) Detach the face plate for the control card.
5) Remove the transparent sheet for the memory sheet.



① Transparent sheet
② Face plate

Figure 5-7

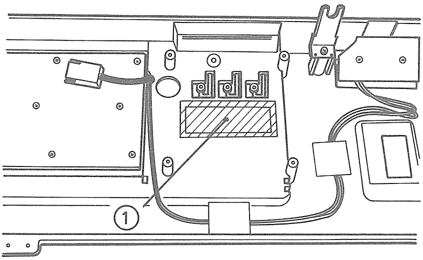
6) Remove the screw from the face plate.



① Screw

Figure 5-8

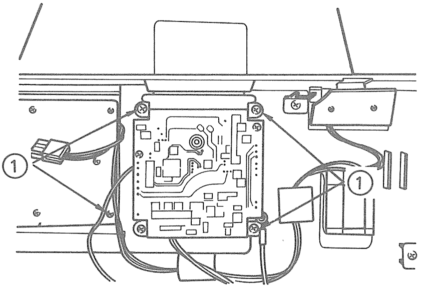
7) Turn over the control panel.
8) Place the mylar sheet over the hole in the control panel.



① Mylar sheet

Figure 5-9

9) Remove the protective sheet from the indicating plate of Control Card V.
10) Fix Control Card V on the control panel using four screws.
Try inserting a card into Control Card V, and fix Control Card V at a point that allows the card to slide in and out smoothly.



① Screws

Figure 5-10

Check that the connector for the printer is centered in the hole.

① Connector

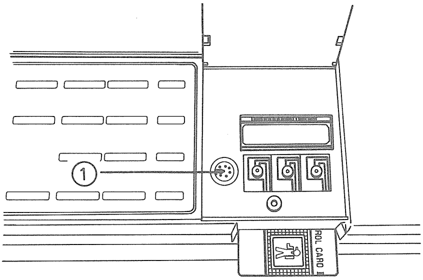
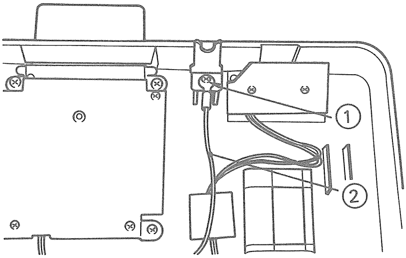


Figure 5-11

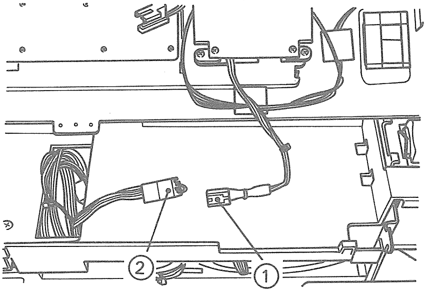
11) Fix the grounding wire of Control Card V using a screw (M3X10; accessory).



① Screw
② Grounding wire

Figure 5-12

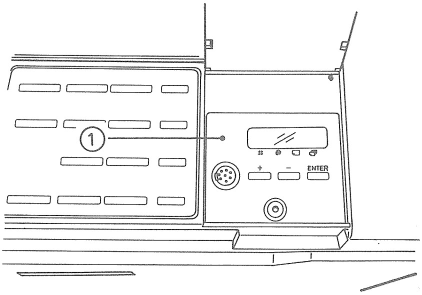
12) Disconnect the shorting connector shown in Figure 5-13.
13) Connect the 4P connector of Control Card V and the 4P connector of the copier.



① 4P connector
② Shorting connector

Figure 5-13

14) Remove the protective sheet from the operating plate of Control Card V.
15) Attach the operating plate of Control Card V to the control panel of the copier.



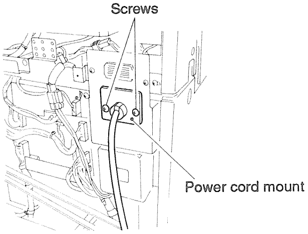
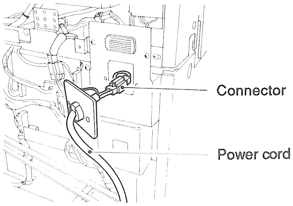
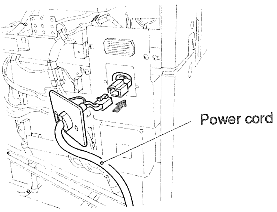
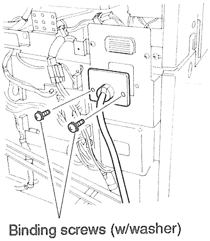
① Operating plate

Figure 5-14

16) Attach the control panel to the copier.
17) Attach the memory sheet and transparent sheet.
18) Switch the copier ON, and check the operation of Control Card V.

V. REPLACING THE POWER PLUG UNIT

For 115V copiers, three types of power plug are made available. At time of shipment, a type A plug is attached to the copier, and types B and C come as service parts.
To replace the plug, perform the following:

Step	Work	Checks/Remarks
1	Remove the two screws, and detach the power cord mount.	 Screws Power cord mount
2	Remove the connector, and detach the power cord.	 Connector Power cord
3	Connect the power cord connector.	
4	Fix the power cord mount in place using two binding screws (w / washer).	 Binding screws (w/washer)

CHAPTER 6

MAINTENANCE AND SERVICING

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II. CONSUMABLES 6-2

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I. PERIODICALLY REPLACED PARTS

Some parts of the machine need to be replaced on a periodical basis; they may be free of wear but bring about grave operational consequences when they fail.

Arrange the replacement so that it will coincide with scheduled visits.

as of July 1990

No.	Parts name	Parts No.	Q'ty	Life (copies)	Remarks
1	Transfer, Pre-transfer, Separation corona wires	FY3-0030-000	AR	160,000	100V
		FY3-0040-000	AR	160,000	115/230V
2	Primary corona wire	FY1-0275-000	AR	160,000	

Note:

The values above are an estimate only and subject to change based on future data.

II. CONSUMABLES

Some parts of the machine need to be replaced at least once over the period of warranty; they may be replaced when they fail to serve expected functions.

as of end of July 1990

No.	Parts name	Parts No.	Q'ty	Life (copies)	Remarks
1	Scanning lamp	FH7-3080-030	1	160,000	100V
		FH7-3166-000	1	160,000	115V
		FH7-3225-000	1	160,000	230V
2	Separation roller (paper deck)	FL9-0078-000	1	160,000	
3	Pick-up roller (duplexing unit)	FA3-2615-020	2	160,000	
4	Separation roller (duplexing unit)	FL9-0070-000	2	160,000	
5	Cleaning unit separation claw	FA3-1937-020	4	160,000	
6	Fixing cleaning belt	FA5-3720-000	1	160,000	
7	Feed roller (paper deck)	FL9-0077-000	1	320,000	
8	Pick-up roller (paper deck)	FA5-7789-000	2	320,000	
9	Pick-up roller (cassette unit)	FA3-2615-020	12	320,000	Upper/Lower
10	Thermistor (fixing assembly)	FH7-7098-000	1	320,000	
11	Fixing assembly upper roller	FG2-2180-000	1	320,000	Includes thermister cleaner.
12	Scraper (Pre-transfer assembly)	FA4-1867-000	1	480,000	
13	Fixing assembly lower roller	FA6-4282-000	1	480,000	
14	Grid wire (primary, separation assemblies)	Y81-0162-000	1	640,000	
15	Primary corona wire cleaner	FF2-3551-000	1	640,000	
16	Primary corona wire cleaner	FF2-3552-000	1	640,000	
17	Transfer/separation corona wire cleaner	FF2-0337-030	1	640,000	
18	Pre-transfer corona wire cleaner	FF2-3531-000	1	640,000	
19	Developing cylinder	FA6-4350-000	1	640,000	
20	Developing assembly roll	FA5-3770-000	2	640,000	
21	Developing assembly side seal (front)	FA3-2252-000	1	640,000	
22	Developing assembly side seal (rear)	FA3-2253-000	1	640,000	
23	Cleaning blade (drum cleaning unit)	FA4-1827-000	1	640,000	Both edges
24	Separation claw drive unit	FG2-0986-000	1	640,000	
25	Insulating bush (fixing assembly)	FA3-2668-020	1	640,000	
26	Delivery unit upper separation claw	FA6-4296-000	5	640,000	
27	Primary corona assembly	FG2-0989-000	1	1,120,000	
28	Transfer/separation corona assembly	FG2-1792-000	1	1,120,000	
29	Pre-transfer corona assembly	FG2-0987-000	1	1,120,000	
30	Delivery unit lower separation claw	FA6-4417-000	5	1,120,000	

Note:

The values above are an estimate only and subject to change based on future data.

III. PERIODICAL SERVICING

Note:

1. As a rule, carry out periodical servicing every 160,000 copies.
2. Check the Service Record in advance, and take parts if replacement is expected.

Step	Work	Items to check	Remarks
1	Meet the user.	Gain an understanding of the general condition of the copier.	
2	Take notes of the counter reading.	Check problem copies.	
3	Make test copies.	Check the following: a. Density of the copy. b. White background of the copy for dirt. c. Clarity of the characters. d. Margin along the leading edge. e. Fixing, registration; back of copy for dirt. f. Abnormal sound. g. Operation of the counter.	Standard: 4.0 ± 1.0 mm (DIRECT)
4	Clean the following: • Corona wire • Grid wire • Shield plate • Roller electrode		Dry wipe the part using lint-free paper and then alcohol solution.
5	Clean the following (optical unit): • Reflecting plate (for scanning lamp) • Side reflecting plate (for scanning lamp) • Lens • N0. 1, 2 3, 4 mirrors • Dust-proof glass • Pre-exposure lamp mylar • Standard white plate		Clean the part using a blower brush; if the dirt cannot be removed, use alcohol solution. Clean the part using a moist cloth. Dry wipe the part.
6	Check the waste toner receptacle.	If toner has taken up more than half the receptacle, empty the receptacle into a plastic bag for disposal.	

Step	Work	Items to check	Remarks
7	Clean the transfer guide. • Transfer guide plate (upper, lower) • Transfer/separation corona assembly guide rail.		Detach the photosensitive drum and drum cleaning unit.
8	Check and clean the cleaning unit. • Magnet roller (check) • Separation claw (clean)	If the coating of toner on the magnet roller is not even, turn the roller to remove paper lint and all visible dust.	Attach the drum cleaning unit.
9	Clean the separation/feeder assembly. • Feed belt		Attach the photosensitive drum thereafter.
10	Clean the fixing/delivery assembly. • Guide • Separation claw (upper, lower) • Blet (check)		Use solvent. Use solvent.
11	Carry out periodical maintenance according to the number of copies made.		
12	Clean the copyboard glass.		Use alcohol solution.
13	Make test copies.		
14	Make sample copies.		
15	Put sample copies in order; clean up the area around the machine.		
16	Record the counter reading.		
17	Fill out the Service Sheet, and report to the user.		

IV. PERIODICAL SERVICING CHART

Note:

Do not use oils or solvents other than those specified.

△ Clean ● Replace × Oil ☐ Adjust ◎ Check

Item	Part	Interval				Remarks
		every 160,000	every 320,000	every 480,000	every 640,000	
Externals	Copyboard glass	△				
	Ozone filter	△				
Scanner drive unit	Scanner cable	◎ ☐				Check and adjust after first 160,000 copies only.
	Scanner rail		△/ ×			Clean the part using alcohol solution; then, apply oil.
Pick-up unit	Pick-up, Separation roller	△				
Transfer/ Separation, Feed assemblies	Transfer guide plate (upper, lower)		△			Clean the part using a moist cloth.
	Feed belt, feed guide plate					
Optical path	No. 1 through No. 4 mirrors		△			Or, four months; whichever comes earlier. Clean the part using a blower brush.
	Dust-proof glass		△			
	Lens		△			
	Scanner reflecting plate		△			
	Scanner side reflecting plate		△			
	Standard white plate		△			
	Pre-exposure lamp unit mylar				△	Clean the part using a moist cloth.
	Dust-proof filter (scanner cooling fan, ozone filter unit)	△				

Item	Part	Interval				Remarks
		every 160,000	every 320,000	every 480,000	every 640,000	
Corona assembly	Corona wire (primary, pre-transfer, transfer, separation)	●				Clean the part using lint-free paper, then using alcohol solution.
	Grid wire (primary, separation)	△				
	Corona assembly shield plate, cleaning unit	△				Clean the part using a moist cloth.
	Roller electrode roller				△	Remove the build-up of toner; then, clean the part using a moist cloth.
	Roller electrode waste toner		△			
Photosensitive drum	Photosensitive drum			△		Clean the part every 480,000 copies using alcohol solution. Clean the part using lint-free paper; thereafter, using alcohol solution and then lint-free paper.
Drum cleaning unit	Side seal (front, rear)			△		
	Magnet roller			△		
Fixing assembly	Paper guide plate		△			Clean the part using solvent.
	Cleaning belt	●				
	Upper roller		◎			
	Lower roller			◎		
	Cleaner (thermistor unit)		●			
Delivery assembly	Separation claw (upper, lower)	△				Clean the part using solvent.
Waste toner receptacle	Waste toner	◎				Remove it.
Duplexing unit	Delivery/Feed assembly, Vertical path unit, Feed guide plate	△				
	Pick-up, Separation roller	△				

APPENDIX

A. GENERAL TIMING CHART .... A- 1
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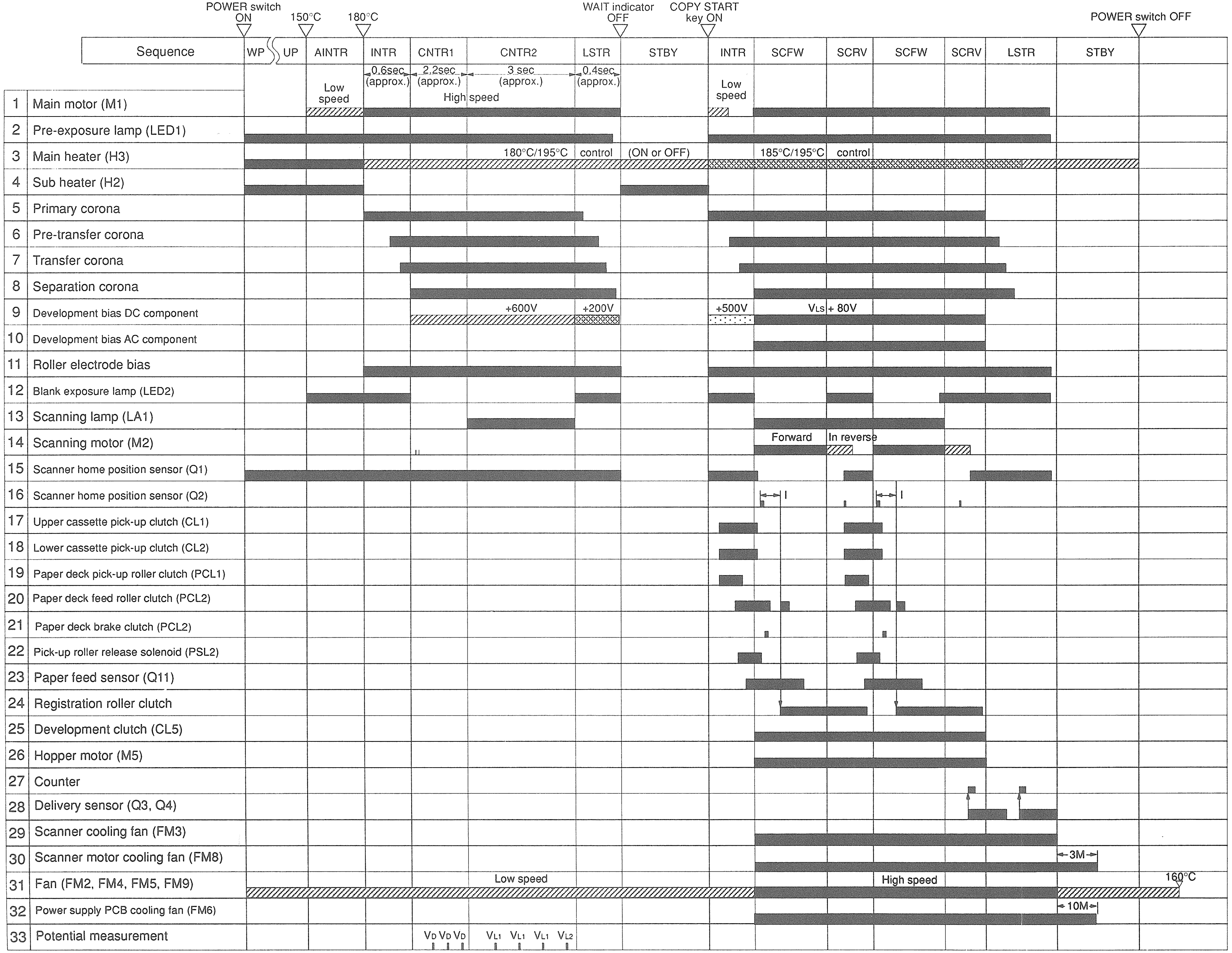
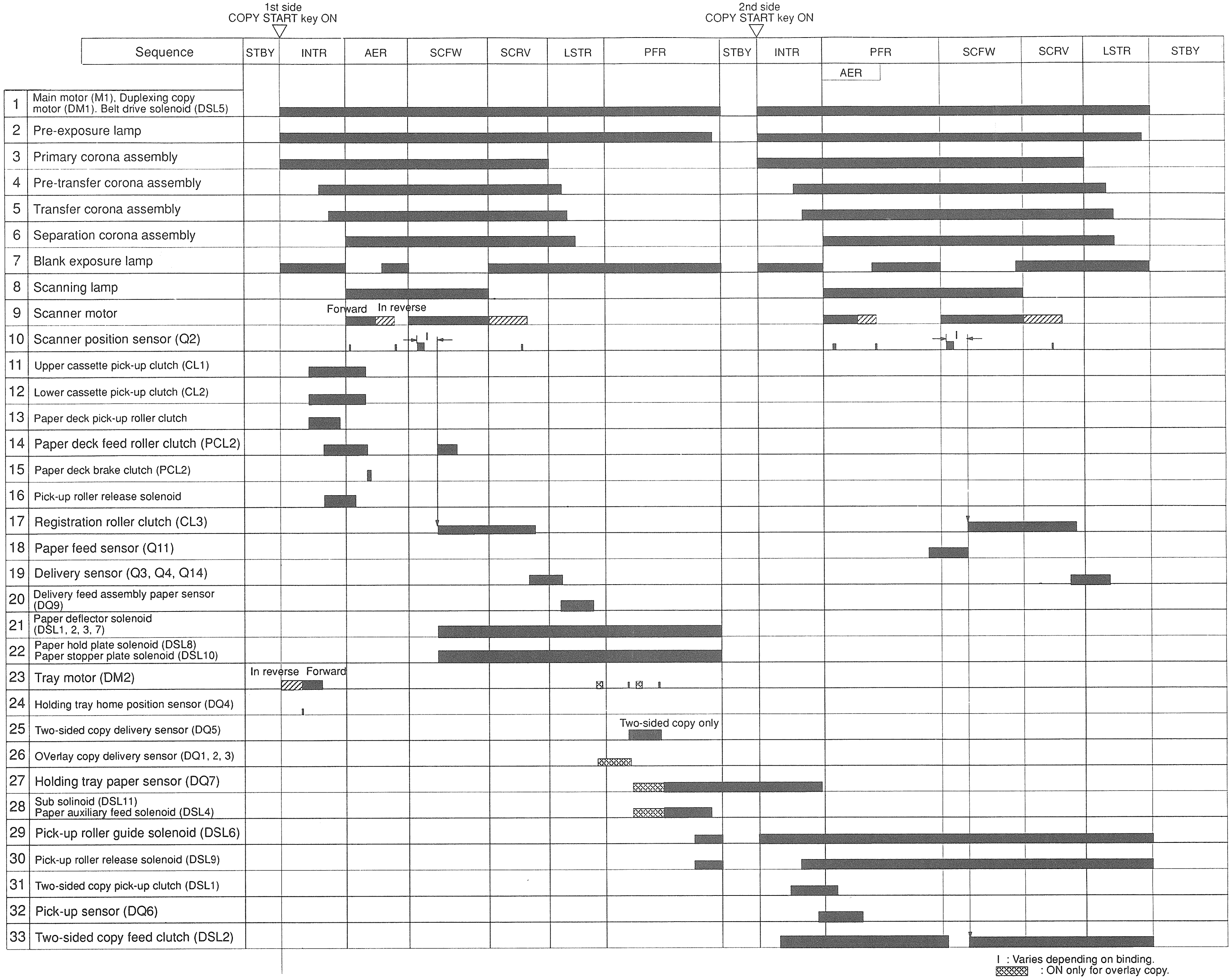
A. GENERAL TIMING CHART


POWER switch ON
150°C
180°C
WAIT indicator OFF
COPY START key ON
POWER switch OFF
Sequence
WP
UP
AINTR
INTR
CNTR1
CNTR2
LSTR
STBY
INTR
SCFW
SCRV
SCFW
SCRV
LSTR
STBY
Low speed
0.6sec (approx.)
2.2sec (approx.)
3 sec (approx.)
0.4sec (approx.)
High speed
Low speed
1 Main motor (M1)
2 Pre-exposure lamp (LED1)
3 Main heater (H3)
4 Sub heater (H2)
5 Primary corona
6 Pre-transfer corona
7 Transfer corona
8 Separation corona
9 Development bias DC component
10 Development bias AC component
11 Roller electrode bias
12 Blank exposure lamp (LED2)
13 Scanning lamp (LA1)
14 Scanning motor (M2)
15 Scanner home position sensor (Q1)
16 Scanner home position sensor (Q2)
17 Upper cassette pick-up clutch (CL1)
18 Lower cassette pick-up clutch (CL2)
19 Paper deck pick-up roller clutch (PCL1)
20 Paper deck feed roller clutch (PCL2)
21 Paper deck brake clutch (PCL2)
22 Pick-up roller release solenoid (PSL2)
23 Paper feed sensor (Q11)
24 Registration roller clutch
25 Development clutch (CL5)
26 Hopper motor (M5)
27 Counter
28 Delivery sensor (Q3, Q4)
29 Scanner cooling fan (FM3)
30 Scanner motor cooling fan (FM8)
31 Fan (FM2, FM4, FM5, FM9)
32 Power supply PCB cooling fan (FM6)
33 Potential measurement
180°C/195°C control
(ON or OFF)
185°C/195°C control
+600V
+200V
+500V
V_{LS} + 80V
Forward
In reverse
II
I
I
3M
Low speed
High speed
160°C
10M
V_D V_D V_D
V_{L1} V_{L1} V_{L1} V_{L2}

I : Varies depending on binding.
II : Length of copy paper.


1st side
COPY START key ON
2nd side
COPY START key ON
Sequence
STBY
INTR
AER
SCFW
SCRV
LSTR
PFR
STBY
INTR
PFR
AER
SCFW
SCRV
LSTR
STBY
1 Main motor (M1), Duplexing copy motor (DM1). Belt drive solenoid (DSL5)
2 Pre-exposure lamp
3 Primary corona assembly
4 Pre-transfer corona assembly
5 Transfer corona assembly
6 Separation corona assembly
7 Blank exposure lamp
8 Scanning lamp
9 Scanner motor
10 Scanner position sensor (Q2)
11 Upper cassette pick-up clutch (CL1)
12 Lower cassette pick-up clutch (CL2)
13 Paper deck pick-up roller clutch
14 Paper deck feed roller clutch (PCL2)
15 Paper deck brake clutch (PCL2)
16 Pick-up roller release solenoid
17 Registration roller clutch (CL3)
18 Paper feed sensor (Q11)
19 Delivery sensor (Q3, Q4, Q14)
20 Delivery feed assembly paper sensor (DQ9)
21 Paper deflector solenoid (DSL1, 2, 3, 7)
22 Paper hold plate solenoid (DSL8) Paper stopper plate solenoid (DSL10)
23 Tray motor (DM2)
24 Holding tray home position sensor (DQ4)
25 Two-sided copy delivery sensor (DQ5)
26 OVerlay copy delivery sensor (DQ1, 2, 3)
27 Holding tray paper sensor (DQ7)
28 Sub solinoid (DSL11) Paper auxiliary feed solenoid (DSL4)
29 Pick-up roller guide solenoid (DSL6)
30 Pick-up roller release solenoid (DSL9)
31 Two-sided copy pick-up clutch (DSL1)
32 Pick-up sensor (DQ6)
33 Two-sided copy feed clutch (DSL2)
Forward
In reverse
I
In reverse
Forward
Two-sided copy only
I : Varies depending on binding.
▨ : ON only for overlay copy.

B. LIST OF SIGNALS/COMMANDS

1. SIGNALS/ COMMANDS

ACBTP	AC BIAS TIMING PULSE signal
BCNNT	DUPLEXING UNIT CONNECTED signal
BDSD	BELT FEED SOLENOID DRIVE command
BKCD	(PAPER Deck) BREAK CLUTCH DRIVE command
BSMD	DUPLEXING UNIT MOTER DRIVE command
BSML	DUPLEXING UNIT MOTER OVER ROAD signal
BUZZER	BUZZER DRIVE command
CBOP	CLEANING BELT OUT PRECAUTION SIGNAL
CBOUT	CLEANING BELT OUT signal
CCV	CONTROL CADE V DRIVE command
CLKP	CLOCK PULSE signal
DB0	DATA B0 signal
DB1	DATA B1 signal
DB2	DATA B2 signal
DB3	DATA B3 signal
DCBC	DC BIAS CONTROL signal
DPDP1	FIRST PASS PAPER DETECTION signal
DPDP2	TWO SIDED PAPER DETECTION signal
DPDP3	IMAGE OVERLAY PAPER DETECTION SIGNAL
DPDP4	PICK UP ARER INDUCT SOLENOID signal
DPISD	PICK UP ROLLER INDUCT SOLENOID DRIVE command
DPRSD	PICK UP ROLLER ENGAGE SOLENOID DRIVE command
DPSDI	DEFLECTOR 1 SOLENOID DRIVE command
DPSD2	HOLDING TRAY PAPER GUIDE SOLENOID DRIVE
DPSDL	DEFLECTOR L SOLENOID DRIVE command
DPSDM	DEFLECTOR M SOLENOID DRIVE command
DPSDS	DEFLECTOR S SOLENOID DRIVE command
DPUCD	PICK UP ROLLER CLUTCH DRIVE command
DRGCD	FEED ROLLER CLUTCH DRIVE command
DVLD	DEVELOPING ASSEMBLY CLUTCH DRIVE command
DVST	DEVELOPING ASSEMBLY SET signal
EFMD	EXHAUST FAN MOTOR DRIVE command
EFMFD	EXHAUST FAN MOTOR FULL DRIVE command
FCD	(PAPER DECK) FEED ROLLER CLUTCH DRIVE command
FDO	FRONT DOOR OPEN signal
FFMD	FEEDER UNIT FAN MOTOR DRIVE command
FM6ON	FM6 DRIVE command
HMD	HOPPER MOTER DRIVE command
HMDPI	HOPPER MOTER DRIVE PULSE 1
HMDP2	HOPPER MOTER DRIVE PULSE 2
HTRD	HEATER DRIVE command
HVPON	PRE-TRANSFER CORONA CURRENT ON command
HVPCT	PRE-TRANSFER CORONA CURRENT CONTROL signal
HVSCT	SEPARATION CORONA CURRENT CONTROL signal
HVSON	SEPARATION CORONA CURRENT ON signal
HVTP	PRIMARY CORONA CURRENT ON command
HVTPC	PRIMARY CORONA CURRENT CONTROL signal
HVTT	TRANSFER CORONA CURRENT ON command
HVTTC	TRANSFER CORONA CURRENT CONTROL signal
IFMD	INTAKE FAN MOTOR DRIVE
IFMD2	INTAKE FAN MOTOR 2 DRIVE command
JOINT	TOP JOINT signal
KSR0	KEY SCAN 0 INPUT signal
KSR1	KEY SCAN 1 INPUT signal
KSR2	KEY SCAN 2 INPUT signal
KSR3	KEY SCAN 3 INPUT signal
KSR4	KEY SCAN 4 INPUT signal
KSR5	KEY SCAN 5 INPUT signal
KSR6	KEY SCAN 6 INPUT signal
KSR7	KEY SCAN 7 INPUT signal
LHP	LENS HOME POSITION signal
LIDE	LIFTER DRIVE ENABLE command
LINT	LIGHT INTENSITY CONTROL signal
LMD	LENS MOTOR DRIVE command
LMDP1	LENS MOTOR DRIVE PULSE 1
LMDP2	LENS MOTOR DRIVE PULSE 2
LPEP	LOWER CASSETTE PAPER OUT signal
LPUCD	LOWER PICK UP ROLLER CLUTCH DRIVE command
LRD	LAMP REGULATOR DRIVE command
MFS	MANUAL PAPER FEED MODE SELECTED signal
MMCLK	MAIN MOTOR CLOCK PULSE
MMSC0	MAIN MOTOR SPEED CONTROL 0 signal
MMSC1	MAIN MOTOR SPEED CONTROL 1 signal
MPD	MANUAL PAPER DETECTION signal
MPUSD	MANUAL PICK UP ROLLER SOLENOID DRIVE command
MPUSD1	MANUAL PICK UP ROLLER RASING SOLENOID DRIVE
MPUSD2	MANUAL PICK UP GATE SOLENOID 2 DRIVE
PAFSD	PAPER AUXILIARY FEED CLUTCH DRIVE command
PCLMD	PRIMARY CORONA WIRE CLEANING UNIT MOTOR DRIVE command
PCLMF	PRIMARY CORONA WIRE CLEANING UNIT DRIVE FORWARD command
PCNNT	PAPER DECK CONNECT signal
PDP1	DELIVERY ARER (REAR) PAPER DETECTION signal
PDP2	DELIVERY ARER (FRONT) PAPER DETECTION signal
PDP3	PAPER FEED AREA PAPER DETECTION signal
PDP4	FIXING ASSEMBLY PAPER DETECTION signal
PDP5	DELIVERY ARER (MIDDLE) PAPER DETECTION signal
PDPL	PAPER DETECTION L signal
PDPM	PAPER DETECTION M signal
PDPS	PAPER DETECTION S signal
PEXP	PRE-EXPOSURE LAMP DRIVE signal
POT	SURFACE POTENTIAL signal
PRSD	PICK-UP ROLLER RELEASE SOLENOID DRIVE command
PSS	PAPER STOP PLATE SOLENOID DRIVE command
PUCD	(PAPER DECK) PICK UP ROLLER CLUTCH DRIVE command
RCVR	REAR panel SWITCH signal
RGDC	REGISTRATION ROLLER CLUTCH DRIVE command
ROED	ROLLER ELECTRODE BIAS DRIVE command
SCDP	SCANNER POSITION SENSOR signal
SCFW	SCANNER FORWARD DRIVE signal
SCHP	SCANNER HOME POSITION signal
SCMCLK	SCANNER MOTOR CLOCK signal
SCNTD	SMALL COUNTER DRIVE command
SCRC1	REPRODUCTION RATIO signal 1
SCRC2	REPRODUCTION RATIO signal 2
SCSC	SCANNER MOTOR SPEED CONTROL signal
SCST	SCANNER MOTOR STOP command
SDMD	SCANNER MOTOR DRIVE command
SHD	SUB HEATER DRIVE command
SS0	SCAN S0 signal
SS1	SCAN S1 signal

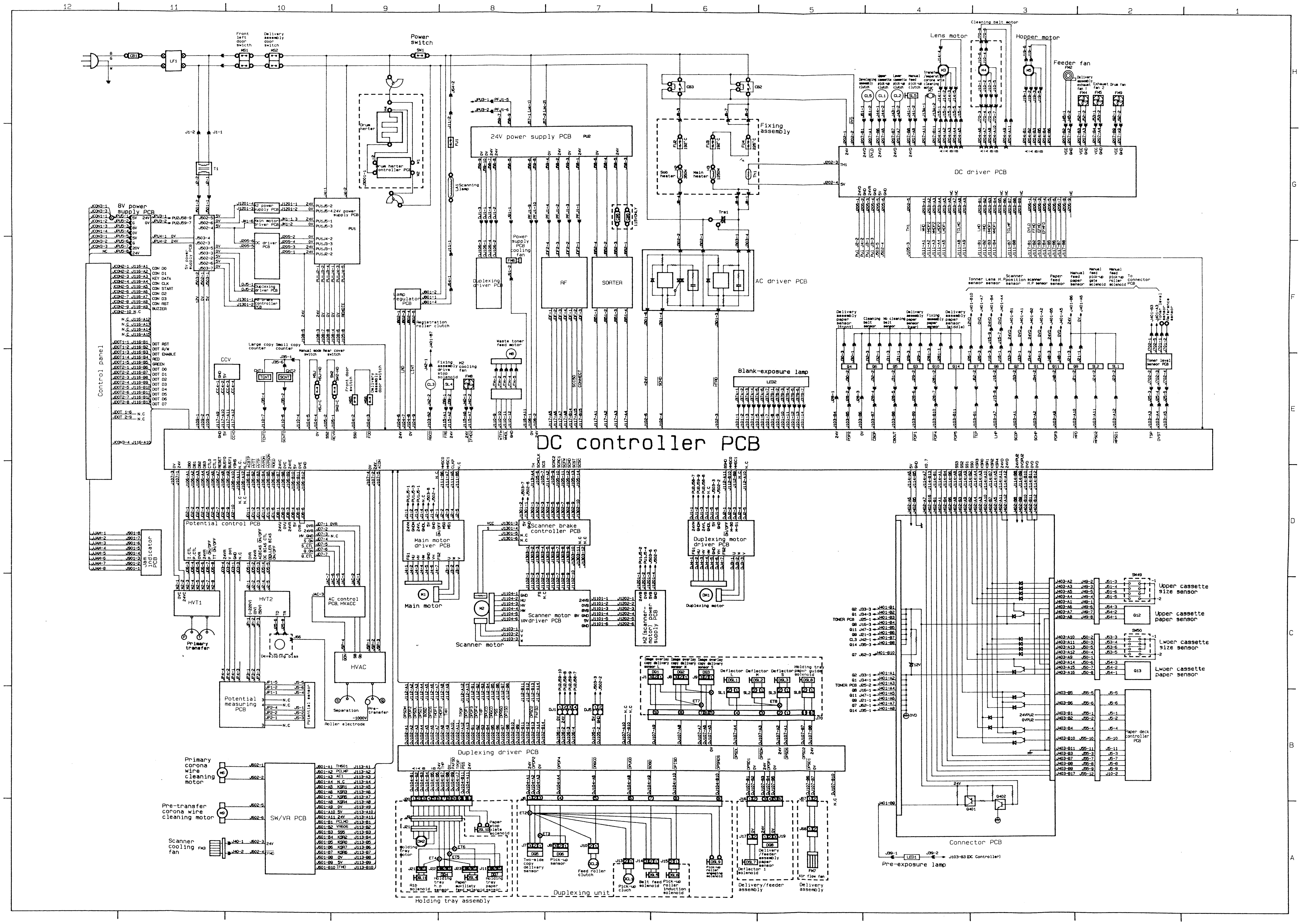
SS2	SCAN S2 signal
SS3	SCAN S3 signal
SS4	SCAN S4 signal
TCLMD	TRANSFER/SEPARATION CORONA WIRE CLEANING UNIT DRIVE MOTOR DRIVE command
TCLMF	TRANSFER/SEPARATION CORONA WIRE CLEANING UNIT FORWARD command
TCNTD	TOTAL COUNTER DRIVE command
TEP	TONER OUT signal
TH	THERMISTOR signal
TH1	THERMISTOR 1 signal
TH2	THERMISTOR 2 signal
THP	HOLDING TRAY SIDE PLATE HOME POSITION signal
TMDP1	TRAY MOTOR DRIVE PULSE 1
TMDP2	TRAY MOTOR DRIVE PULSE 2
TMH	TRAY MOTOR HOLD signal
TPDP	HOLDING TRAY PAPER DETECTION signal
TSP	TONER SUPPLY signal
UPEP	UPPER CASSETTE PAPER OUT signal
UPRCD	UPPER CASSETTE PICK-UP CLUTCH DRIVE command
WMD	CLEANING BELT MOTOR DRIVE command
WMDP1	CLEANING BELT MOTOR DRIVE PULSE 1
WMDP2	CLEANING BELT MOTOR DRIVE PULSE 2
WMOL	WASTE TONER FEED MOTOR OVER LOAD signal
WTFM	WASTE TONER FEED MOTOR DRIVE command

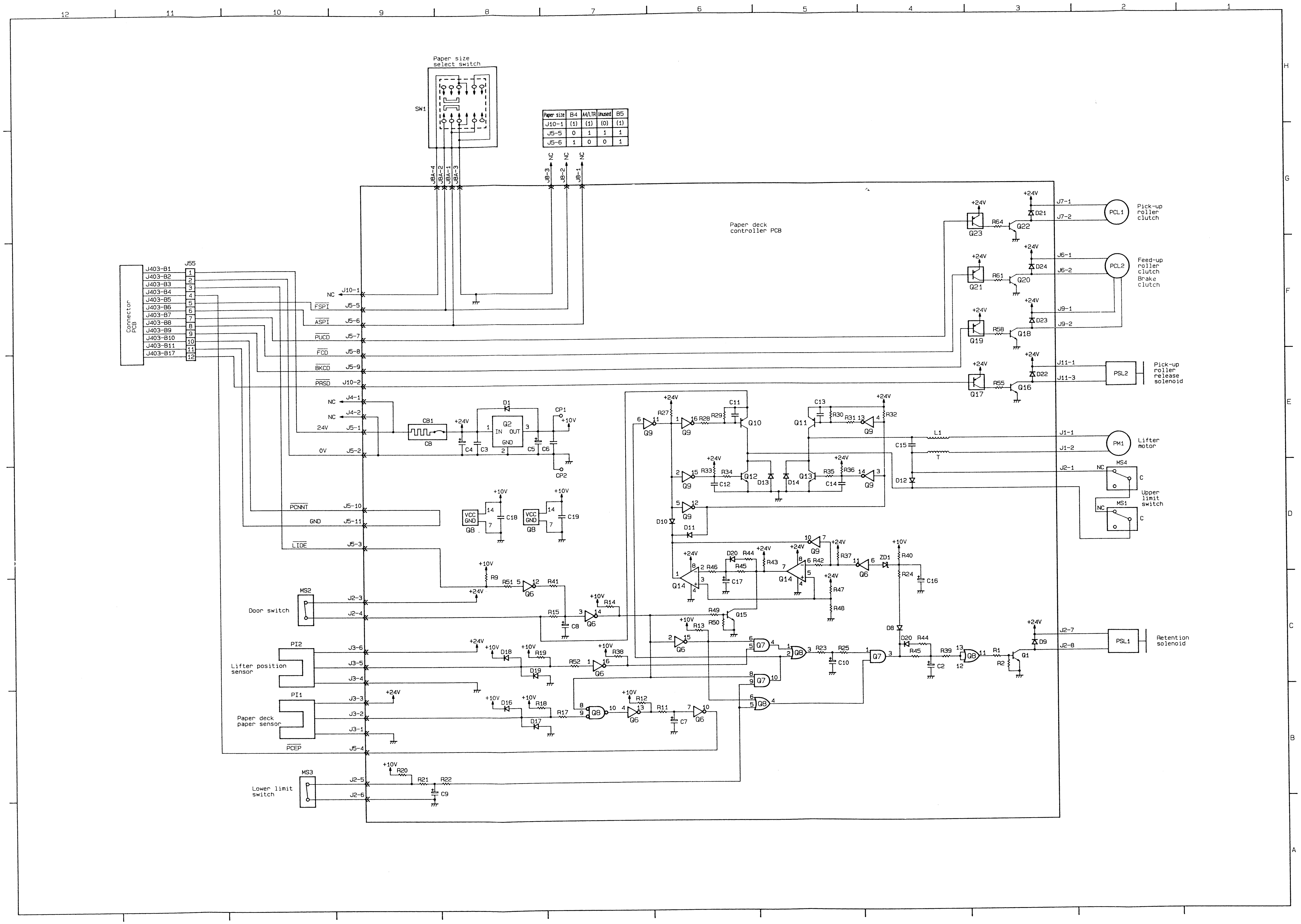
2. LIST OF ABBREUIATION

AER	AE ROTATION
AINTR	ADDITIONAL INITIAL ROTATION
CCC	CORONA CURRENT CONTROL
CNTR1	CONTROL ROTATION 1
CNTR2	CONTROL ROTATION 2
DBC	DEVELOPING BIAS CONTROL
DMS	DISPLAY MODE SELECTION
HLC	SCANNING LAMP ILLUMINATION CONTROL
INITIAL	INITIAL ROTATION
LSTR	LAST ROTATION
PFR	PAPER FEED ROTATION
SCFW	SCANNER FORWARD
SCRV	SCANNER REVERSE
STBY	STANDBY
VD	SURFACE POTENTIAL IN DARK AREA
VL1	SURFACE POTENTIAL IN LIGHT AREA 1
VL2	SURFACE POTENTIAL IN LIGHT AREA 2
WMUP	WARM-UP PERIOD

C. GENERAL CIRCUIT DIAGRAM

1. COPIER GENERAL CIRCUIT DIAGRAM

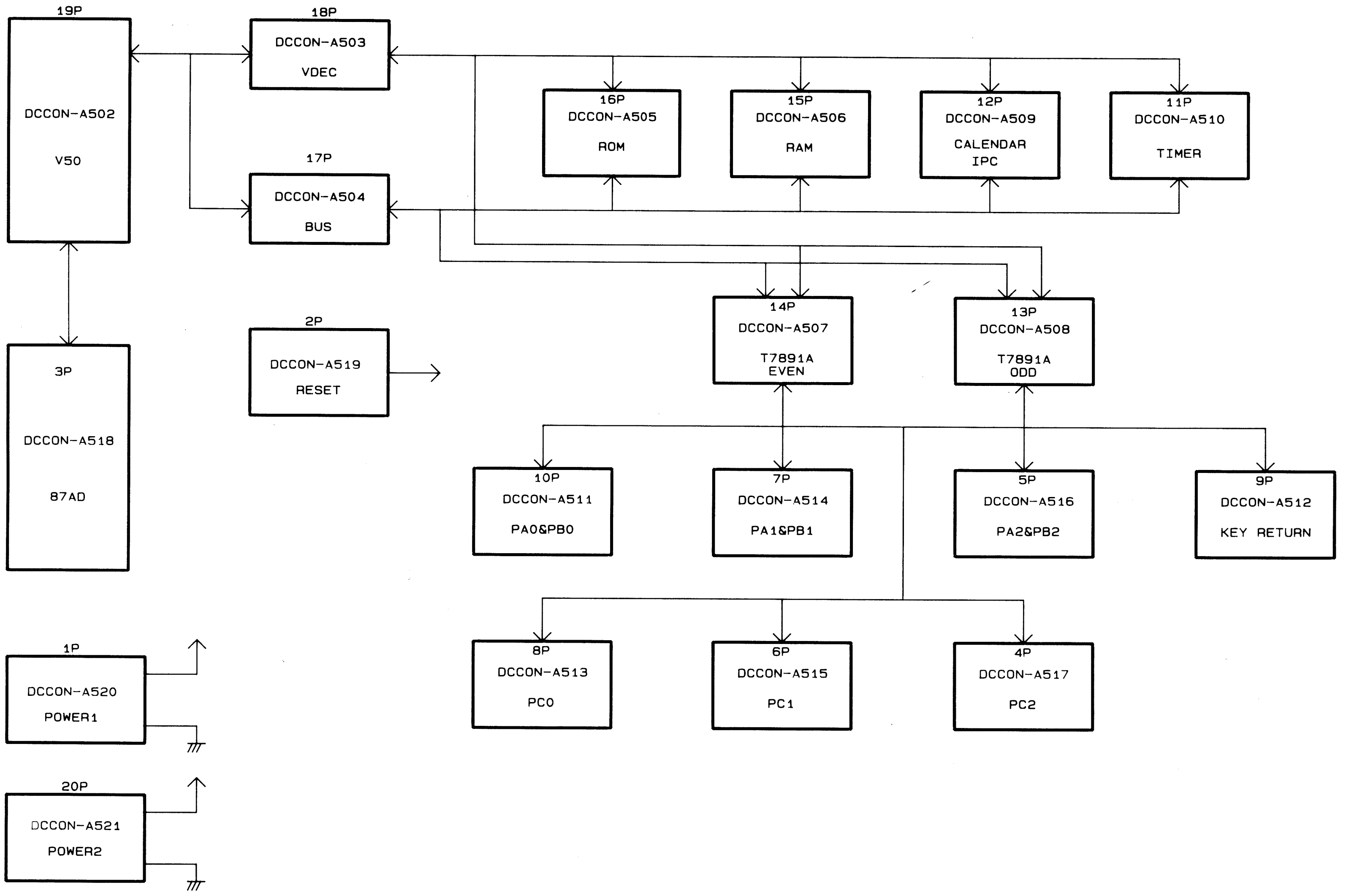

DC controller PCB
Control panel
8V power supply PCB
Jam indicator PCB
24V power supply PCB
DC driver PCB
Power switch
Front left door switch
Delivery assembly door switch
Drum heater
Drum heater controller PCB
Scanning lamp
Fixing assembly
Sub heater
Main heater
Lens motor
Hopper motor
Feeder fan
Cleaning belt motor
Duplexing driver PCB
RF
SORTER
AC driver PCB
Blank-exposure lamp
CCV
Large copy counter
Small copy counter
Lamp regulator PCB
Registration roller clutch
Waste toner feed motor
Fixing assembly drive stop solenoid
Power supply PCB cooling fan
Potential control PCB
HVT1
HVT2
Primary transfer
Developing bias
AC control PCB, HVACC
HVAC
Separation
Pre-transfer
Roller electrode
Potential measuring PCB
Potential sensor
Main motor driver PCB
Main motor
Scanner brake controller PCB
Scanner motor driver PCB
Scanner motor
M2 (scanner-motor) power supply PCB
Duplexing motor driver PCB
Duplexing motor
Primary corona wire cleaning motor
Pre-transfer corona wire cleaning motor
Scanner cooling fan
SW/VR PCB
Holding tray assembly
Duplexing unit
Delivery/feeder assembly
Delivery assembly
Connector PCB
Pre-exposure lamp
Upper cassette size sensor
Upper cassette paper sensor
Lower cassette size sensor
Lower cassette paper sensor
Paper deck controller PCB
Toner level sensor PCB
12 11 10 9 8 7 6 5 4 3 2 1
H G F E D C B A


Paper size select switch
SW1
Connector PCB
J403-B1
J403-B2
J403-B3
J403-B4
J403-B5
J403-B6
J403-B7
J403-B8
J403-B9
J403-B10
J403-B11
J403-B17
J55
J8A-4
J8A-2
J8A-1
J8A-3
J8-3
J8-2
J8-1
NC
J10-1
FSPI
J5-5
ASPI
J5-6
PUCD
J5-7
FCD
J5-8
BKCD
J5-9
PRSD
J10-2
J4-1
J4-2
24V
J5-1
0V
J5-2
CB1
CB
Q2
IN
OUT
GND
CP1
CP2
+10V
+24V
PCNNT
J5-10
GND
J5-11
LIDE
J5-3
VCC
Q8
C18
C19
Paper deck controller PCB
Door switch
MS2
J2-3
J2-4
Lifter position sensor
PI2
J3-6
J3-5
J3-4
Paper deck paper sensor
PI1
J3-3
J3-2
J3-1
PCEP
J5-4
Lower limit switch
MS3
J2-5
J2-6
Q6
Q7
Q8
Q9
Q10
Q11
Q12
Q13
Q14
Q15
Q1
L1
T
C15
D12
Pick-up roller clutch
PCL1
J7-1
J7-2
Q22
Q23
Feed-up roller clutch
Brake clutch
PCL2
J6-1
J6-2
J9-1
J9-2
Q20
Q21
Q18
Q19
Pick-up roller release solenoid
PSL2
J11-1
J11-3
Q16
Q17
Lifter motor
PM1
J1-1
J1-2
Upper limit switch
MS4
MS1
J2-1
C
Retention solenoid
PSL1
J2-7
J2-8
A
B
C
D
E
F
G
H
1
2
3
4
5
6
7
8
9
10
11
12

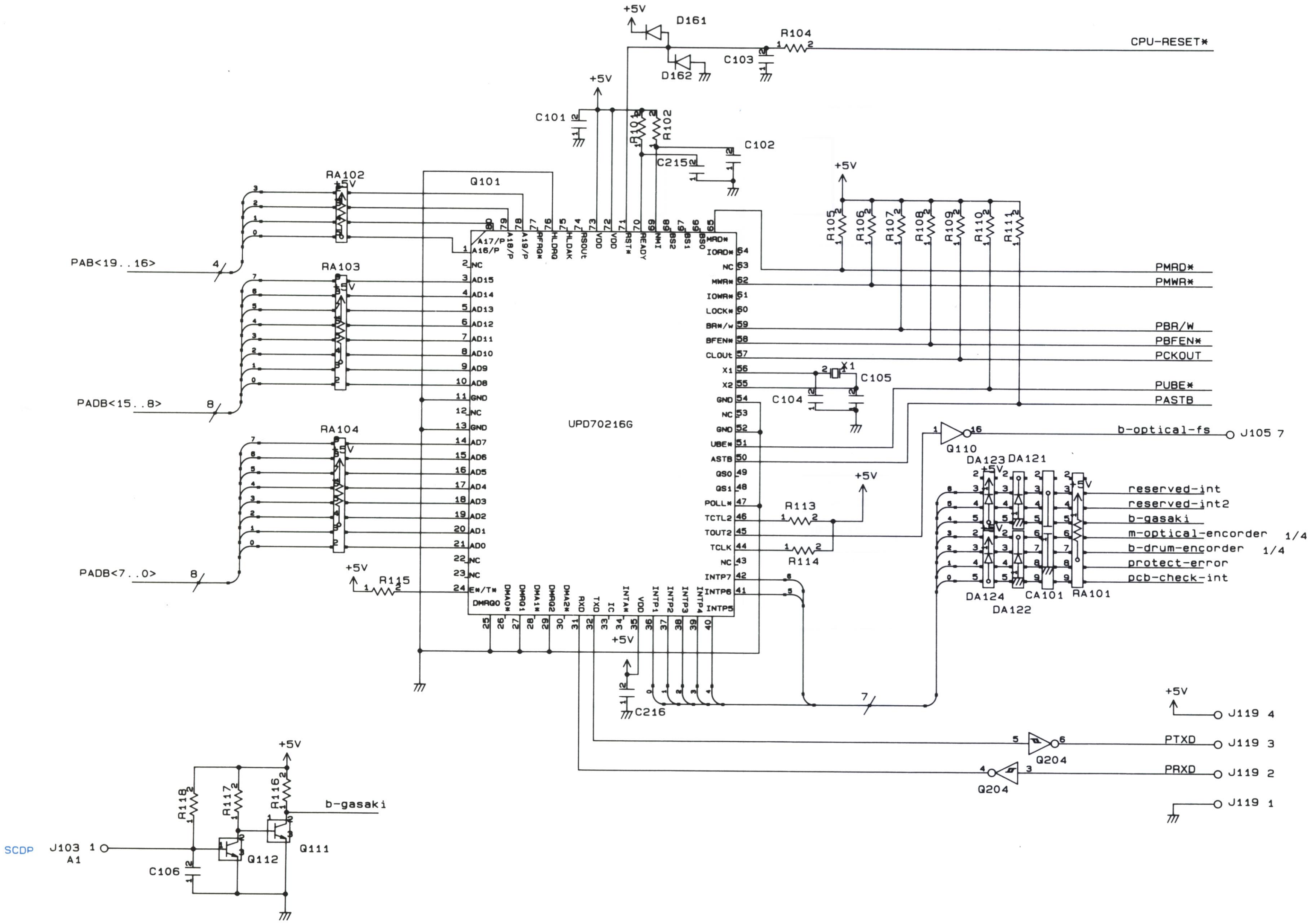
Paper size	B4	A4/LTR	Unused	B5
J10-1	(1)	(1)	(0)	(1)
J5-5	0	1	1	1
J5-6	1	0	0	1

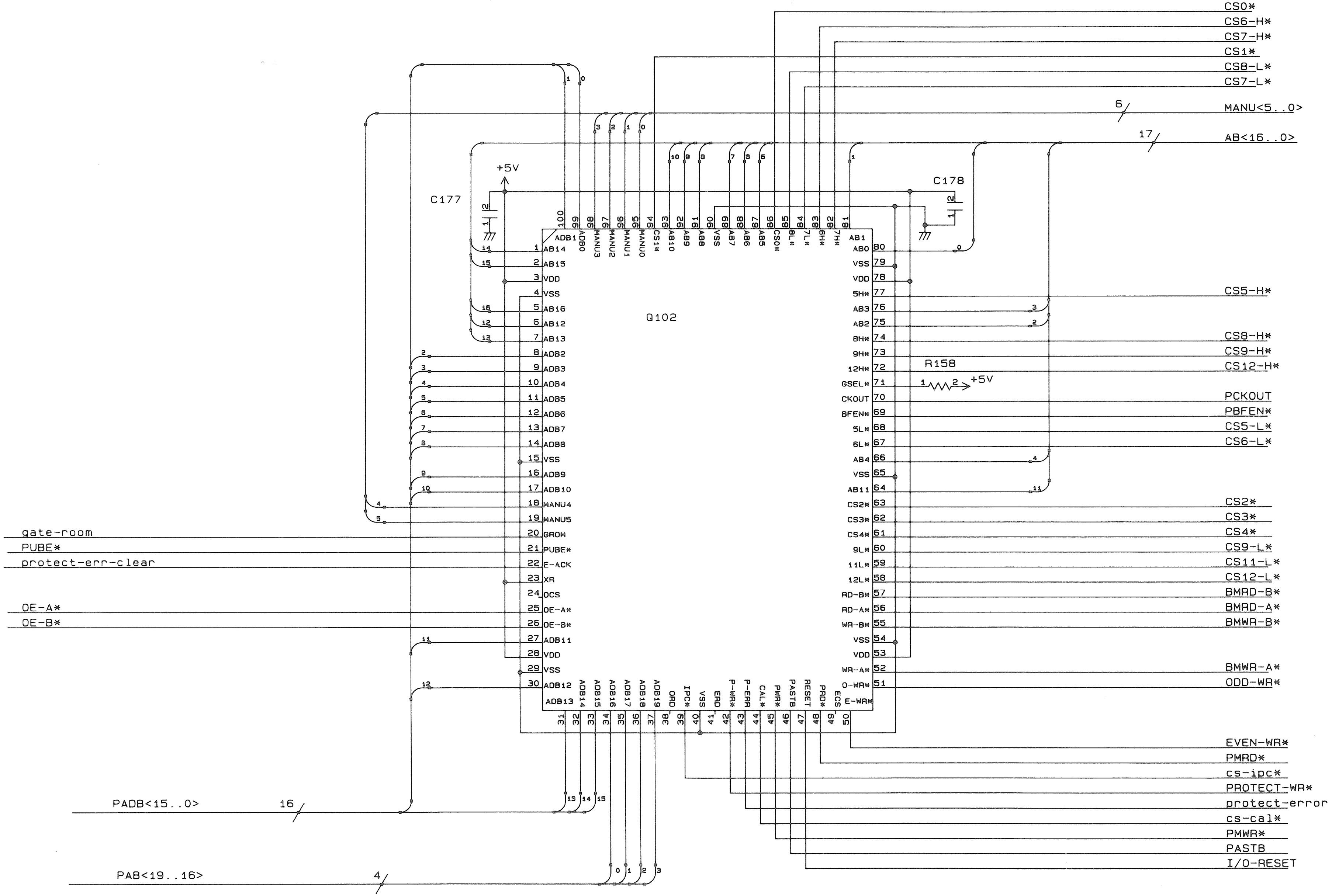
D. DC CONTROLLER CIRCUIT DIAGRAM

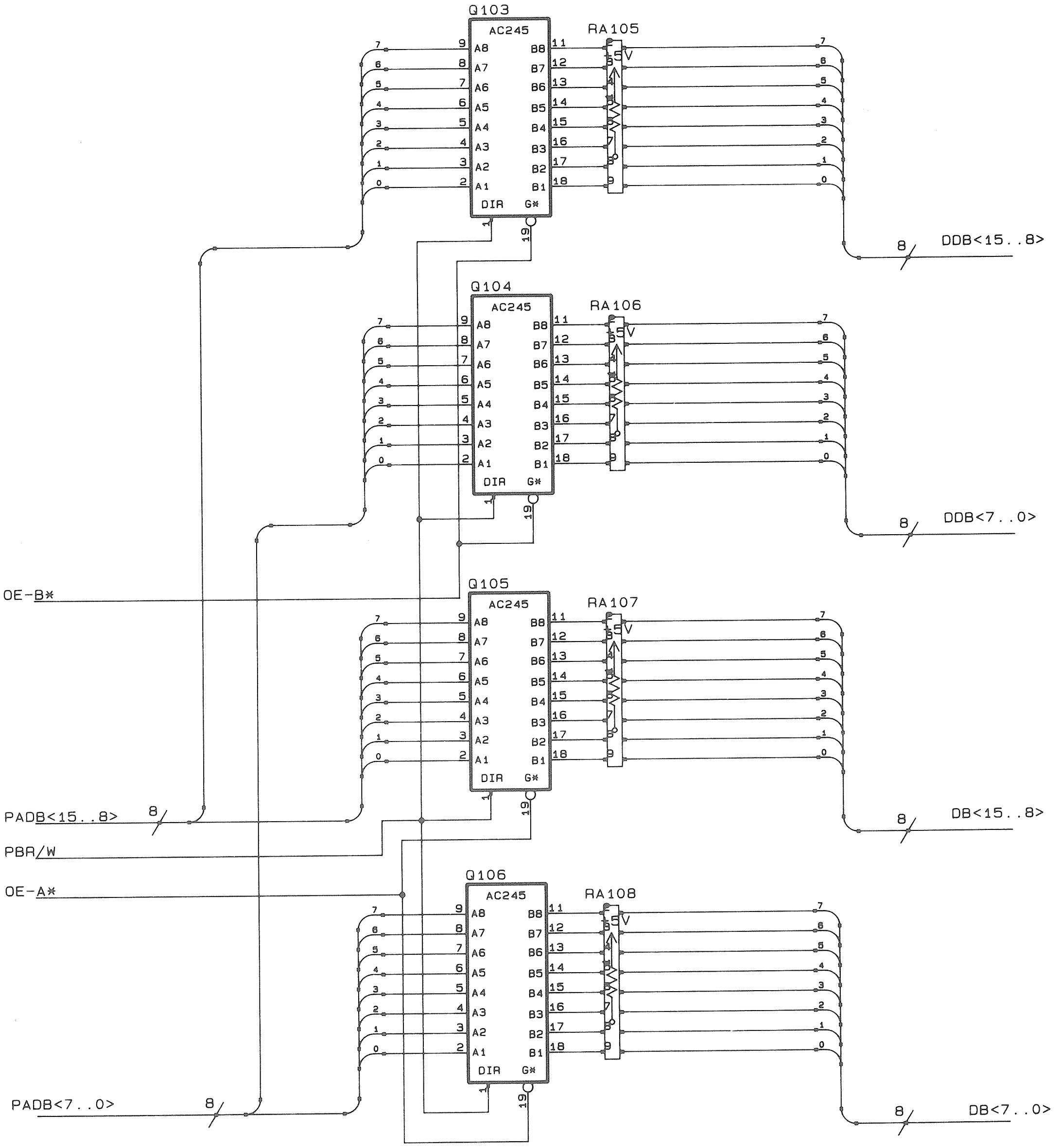
DC CONTROLLER PCB (A501)

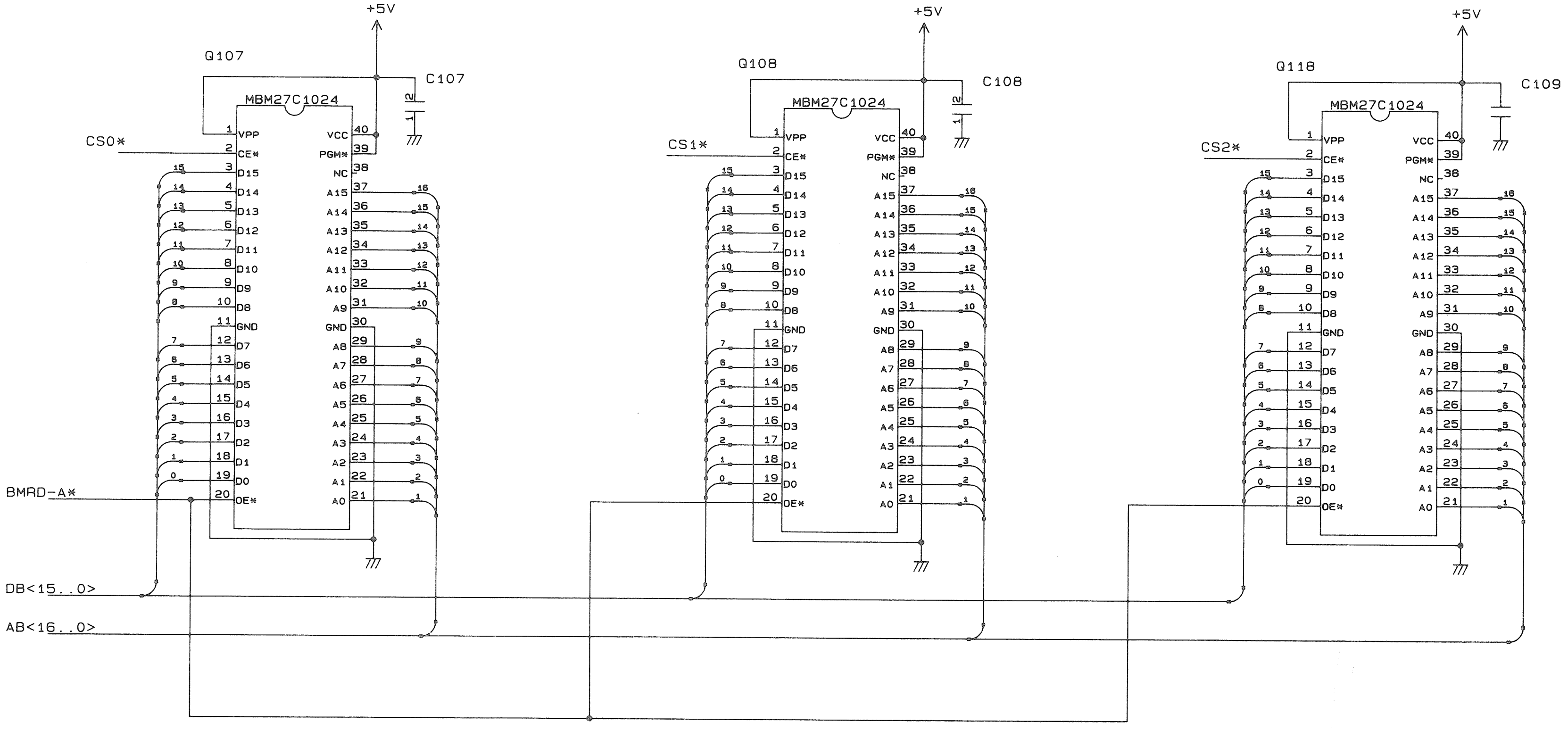

19P
DCCON-A502
V50
18P
DCCON-A503
VDEC
17P
DCCON-A504
BUS
16P
DCCON-A505
ROM
15P
DCCON-A506
RAM
12P
DCCON-A509
CALENDAR
IPC
11P
DCCON-A510
TIMER
3P
DCCON-A518
87AD
2P
DCCON-A519
RESET
14P
DCCON-A507
T7891A
EVEN
13P
DCCON-A508
T7891A
ODD
10P
DCCON-A511
PA0&PB0
7P
DCCON-A514
PA1&PB1
5P
DCCON-A516
PA2&PB2
9P
DCCON-A512
KEY RETURN
8P
DCCON-A513
PC0
6P
DCCON-A515
PC1
4P
DCCON-A517
PC2
1P
DCCON-A520
POWER1
20P
DCCON-A521
POWER2

DC CONTROLLER PCB (A502)

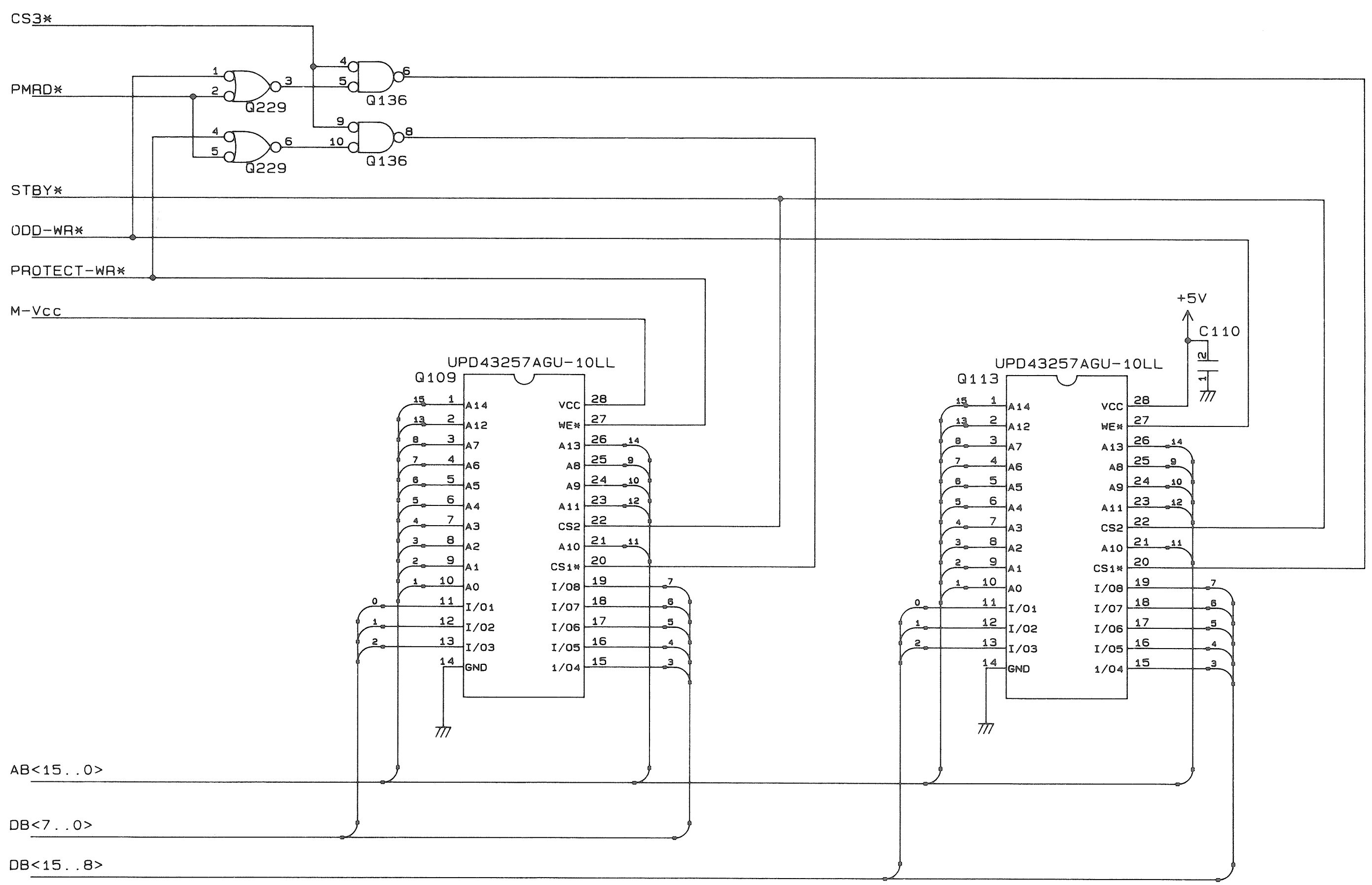

UPD70216G
CPU-RESET*
R104
C103
D161
D162
+5V
C101
R101
R102
C102
C215
Q101
RA102
RA103
RA104
PAB<19..16>
PADB<15..8>
PADB<7..0>
4
8
8
R115
R105
R106
R107
R108
R109
R110
R111
PMRD*
PMWR*
PBR/W
PBFEN*
PCKOUT
PUBE*
PASTB
X1
C104
C105
b-optical-fs
J105 7
Q110
DA123
DA121
DA124
DA122
CA101
RA101
reserved-int
reserved-int2
b-gasaki
m-optical-encorder 1/4
b-drum-encorder 1/4
protect-error
pcb-check-int
R113
R114
7
C216
Q204
PTXD
PRXD
J119 4
J119 3
J119 2
J119 1
SCDP
J103 1
A1
C106
R118
R117
R116
Q112
Q111
b-gasaki
A17/P
A16/P
A18/P
A19/P
RFRQ*
HLDRQ
HLDAK
RSOUt
VDD
RST*
READY
NMI
BS2
BS1
BS0
MRD*
IORD*
NC
MWR*
IOWR*
LOCK*
BRN/W
BFEN*
CLOUt
X1
X2
GND
UBE*
ASTB
QS0
QS1
POLL*
TCTL2
TOUT2
TCLK
INTP7
INTP6
INTP5
INTP4
INTP3
INTP2
INTP1
INTA*
IC
TXD
RXD
DMA2*
DMAQ2
DMA1*
DMAQ1
DMA0*
DMAQ0
E*/T*
AD15
AD14
AD13
AD12
AD11
AD10
AD9
AD8
AD7
AD6
AD5
AD4
AD3
AD2
AD1
AD0

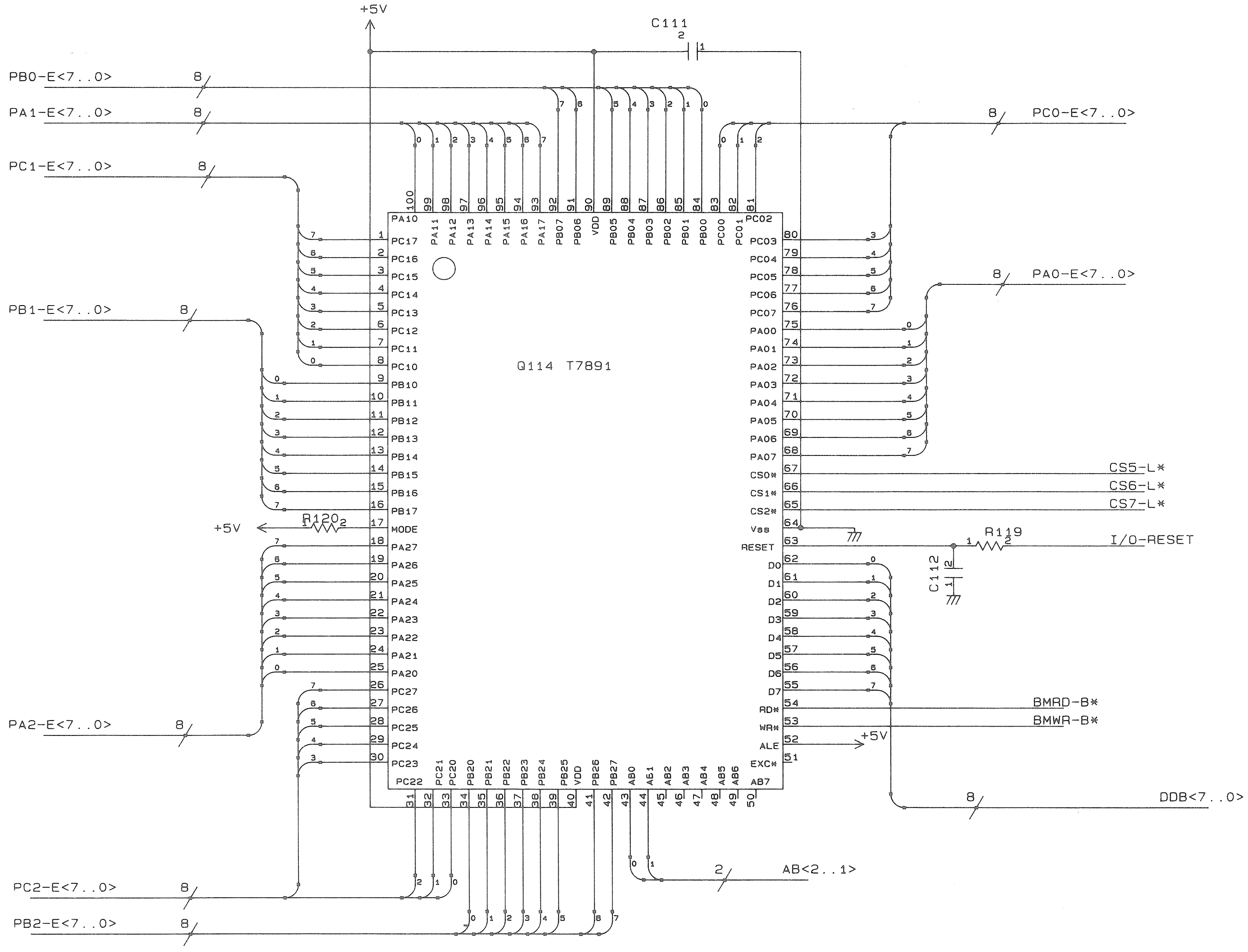

CS0*
CS6-H*
CS7-H*
CS1*
CS8-L*
CS7-L*
MANU<5..0>
6
AB<16..0>
17
C177
C178
+5V
Q102
R158
CS5-H*
CS8-H*
CS9-H*
CS12-H*
PCKOUT
PBFEN*
CS5-L*
CS6-L*
CS2*
CS3*
CS4*
CS9-L*
CS11-L*
CS12-L*
BMRD-B*
BMRD-A*
BMWR-B*
BMWR-A*
ODD-WR*
EVEN-WR*
PMRD*
cs-ipc*
PROTECT-WR*
protect-error
cs-cal*
PMWR*
PASTB
I/O-RESET
gate-room
PUBE*
protect-err-clear
OE-A*
OE-B*
PADB<15..0>
16
PAB<19..16>
4
AB14
AB15
VDD
VSS
AB16
AB12
AB13
ADB2
ADB3
ADB4
ADB5
ADB6
ADB7
ADB8
ADB9
ADB10
MANU4
MANU5
GROM
PUBE*
E-ACK
XR
OCS
OE-A*
OE-B*
ADB11
ADB12
ADB13
ADB14
ADB15
ADB16
ADB17
ADB18
ADB19
ORD
IPC*
ERD
P-WR*
P-ERR
CAL*
PWR*
PASTB
RESET
PRD*
ECS
E-WR*
O-WR*
WR-A*
WR-B*
RD-A*
RD-B*
12L*
11L*
9L*
CS4*
CS3*
CS2*
AB11
AB4
6L*
5L*
BFEN*
CKOUT
GSEL*
12H*
9H*
8H*
AB2
AB3
5H*
AB0
AB1
7H*
6H*
7L*
8L*
CS0*
AB5
AB6
AB7
AB8
AB9
AB10
CS1*
MANU0
MANU1
MANU2
MANU3
ADB0
ADB1


Q103
AC245
RA105
DDB<15..8>
Q104
AC245
RA106
DDB<7..0>
OE-B*
Q105
AC245
RA107
DB<15..8>
PADB<15..8>
PBR/W
OE-A*
Q106
AC245
RA108
PADB<7..0>
DB<7..0>
A8
A7
A6
A5
A4
A3
A2
A1
DIR
G*
B8
B7
B6
B5
B4
B3
B2
B1
5V
8


+5V
Q107
C107
MBM27C1024
CS0*
BMRD-A*
Q108
C108
MBM27C1024
CS1*
Q118
C109
MBM27C1024
CS2*
VPP
CE*
D15
D14
D13
D12
D11
D10
D9
D8
GND
D7
D6
D5
D4
D3
D2
D1
D0
OE*
VCC
PGM*
NC
A15
A14
A13
A12
A11
A10
A9
A8
A7
A6
A5
A4
A3
A2
A1
A0
DB<15..0>
AB<16..0>

DC CONTROLLER PCB (A506)


CS3*
PMRD*
STBY*
ODD-WR*
PROTECT-WR*
M-Vcc
AB<15..0>
DB<7..0>
DB<15..8>
Q229
Q229
Q136
Q136
UPD43257AGU-10LL
Q109
UPD43257AGU-10LL
Q113
+5V
C110
A14
A12
A7
A6
A5
A4
A3
A2
A1
A0
I/01
I/02
I/03
GND
VCC
WE*
A13
A8
A9
A11
CS2
A10
CS1*
I/08
I/07
I/06
I/05
1/04


+5V
C111
PB0-E<7..0>
PA1-E<7..0>
PC1-E<7..0>
PB1-E<7..0>
PA2-E<7..0>
PC2-E<7..0>
PB2-E<7..0>
PC0-E<7..0>
PA0-E<7..0>
CS5-L*
CS6-L*
CS7-L*
R119
I/O-RESET
C112
BMRD-B*
BMWR-B*
DDB<7..0>
AB<2..1>
R120
Q114 T7891
PA10
PC17
PC16
PC15
PC14
PC13
PC12
PC11
PC10
PB10
PB11
PB12
PB13
PB14
PB15
PB16
PB17
MODE
PA27
PA26
PA25
PA24
PA23
PA22
PA21
PA20
PC27
PC26
PC25
PC24
PC23
PC22
PC21
PC20
PB20
PB21
PB22
PB23
PB24
PB25
VDD
PB26
PB27
AB0
AB1
AB2
AB3
AB4
AB5
AB6
AB7
EXC*
ALE
WR*
RD*
D7
D6
D5
D4
D3
D2
D1
D0
RESET
Vss
CS2*
CS1*
CS0*
PA07
PA06
PA05
PA04
PA03
PA02
PA01
PA00
PC07
PC06
PC05
PC04
PC03
PC02
PC01
PC00
PB00
PB01
PB02
PB03
PB04
PB05
VDD
PB06
PB07
PA17
PA16
PA15
PA14
PA13
PA12
PA11

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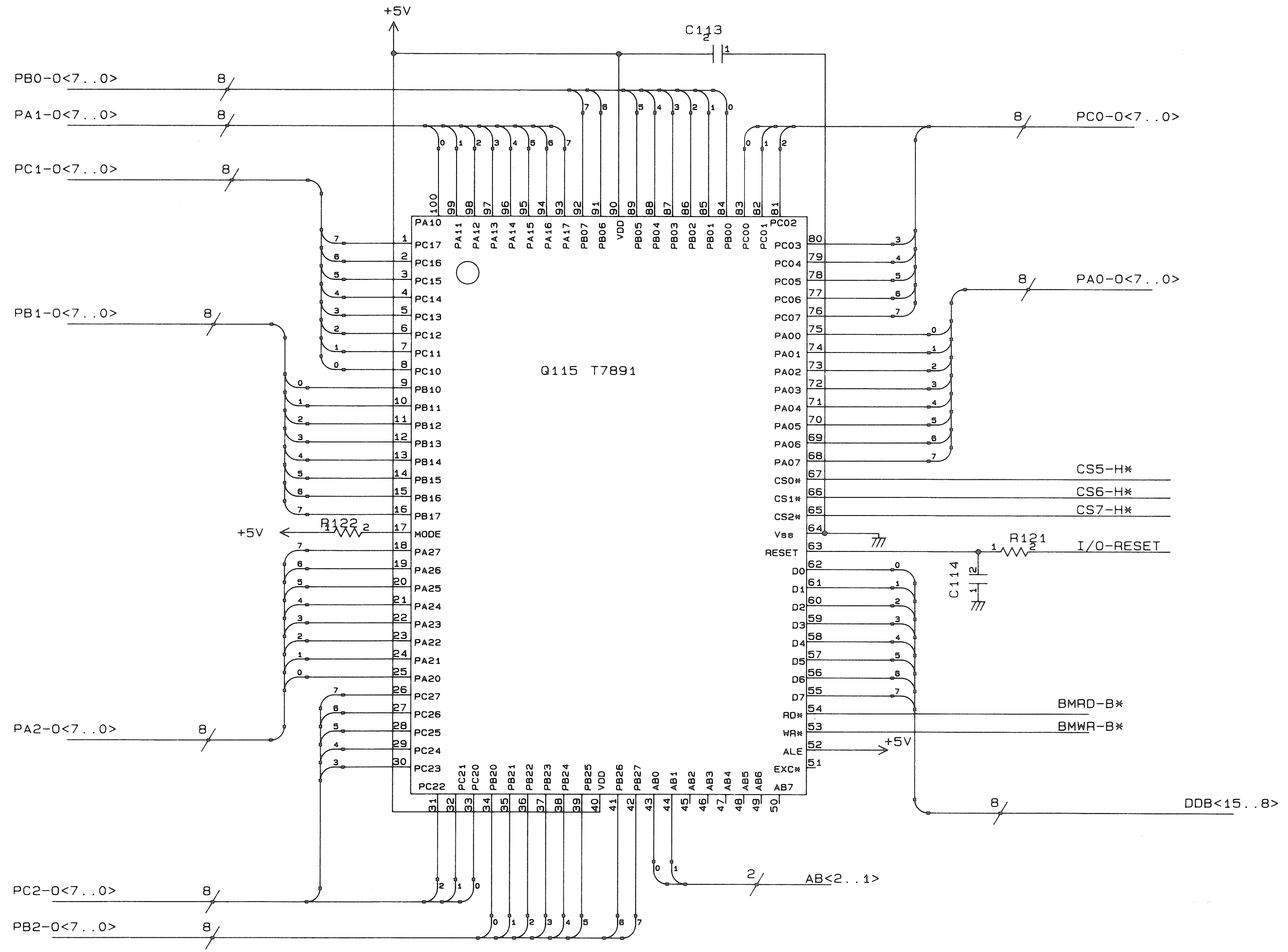
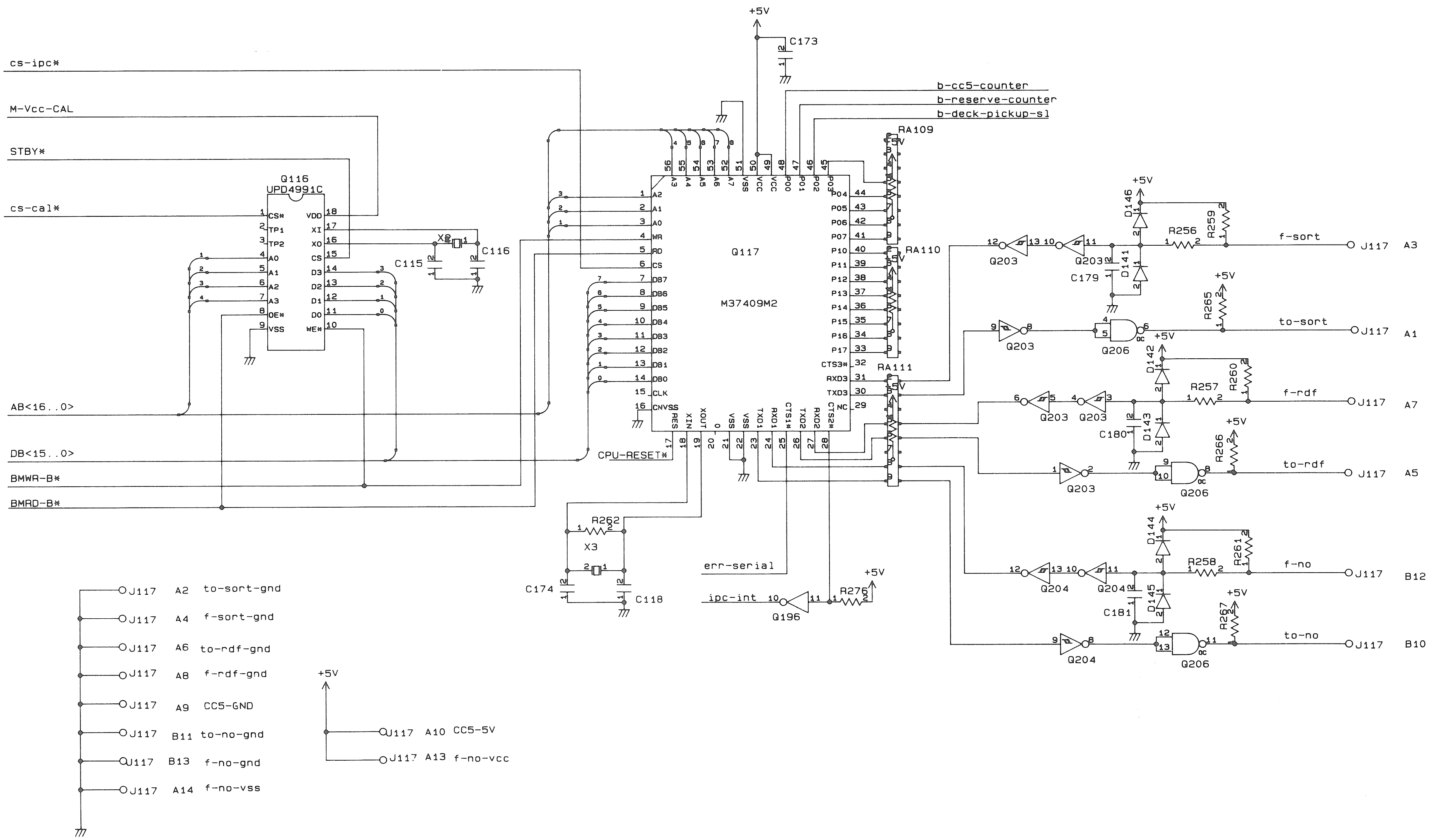
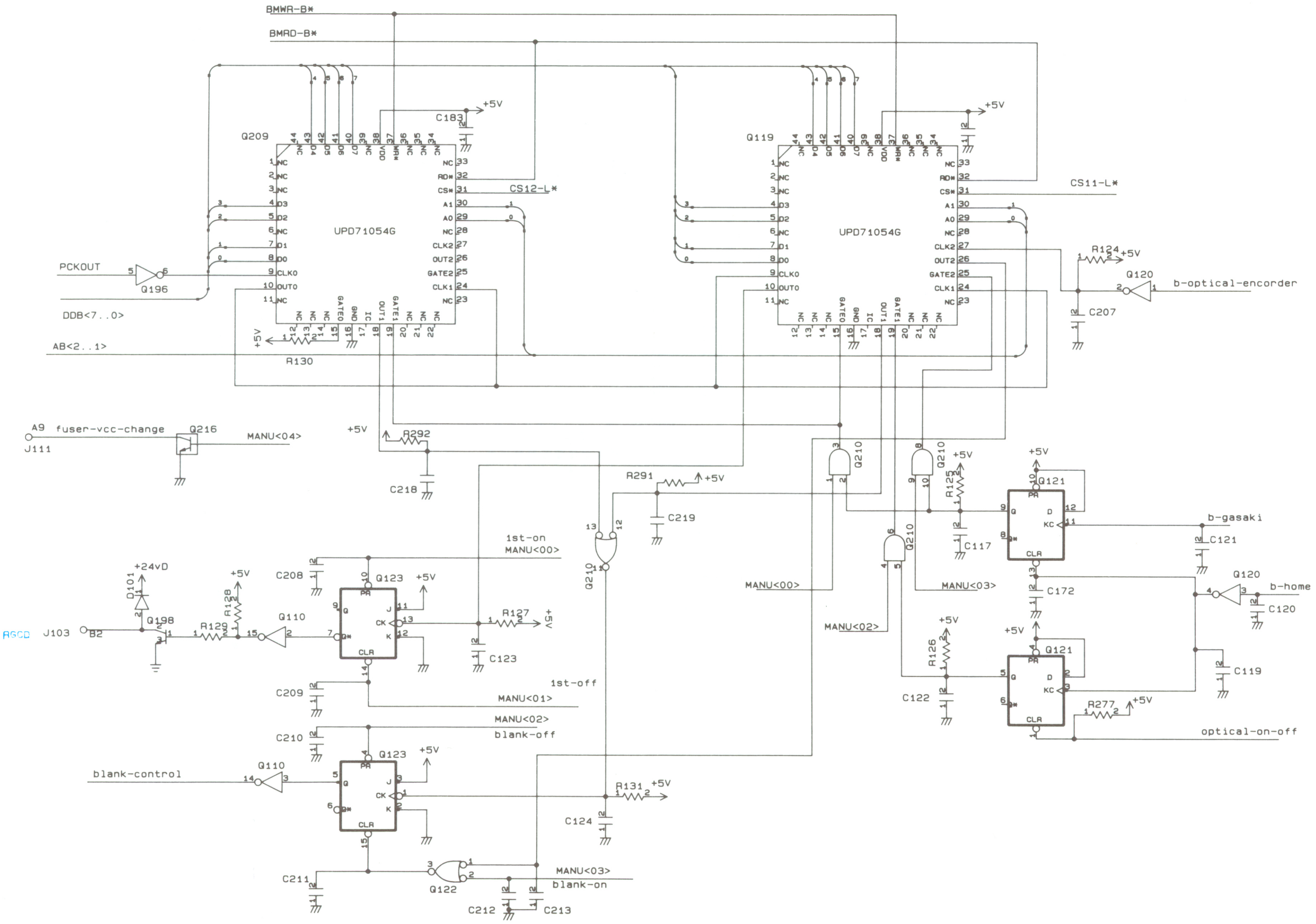

Q115 T7891
+5V
C113
R122
R121
C114
PB0-0<7..0>
PA1-0<7..0>
PC1-0<7..0>
PB1-0<7..0>
PA2-0<7..0>
PC2-0<7..0>
PB2-0<7..0>
PC0-0<7..0>
PA0-0<7..0>
CS5-H*
CS6-H*
CS7-H*
I/O-RESET
BMRD-B*
BMWR-B*
DDB<15..8>
AB<2..1>
PA10
PA11
PA12
PA13
PA14
PA15
PA16
PA17
PB07
PB06
VDD
PB05
PB04
PB03
PB02
PB01
PB00
PC00
PC01
PC02
PC17
PC16
PC15
PC14
PC13
PC12
PC11
PC10
PB10
PB11
PB12
PB13
PB14
PB15
PB16
PB17
MODE
PA27
PA26
PA25
PA24
PA23
PA22
PA21
PA20
PC27
PC26
PC25
PC24
PC23
PC22
PC21
PC20
PB20
PB21
PB22
PB23
PB24
PB25
VDD
PB26
PB27
AB0
AB1
AB2
AB3
AB4
AB5
AB6
AB7
PC03
PC04
PC05
PC06
PC07
PA00
PA01
PA02
PA03
PA04
PA05
PA06
PA07
CS0*
CS1*
CS2*
Vss
RESET
D0
D1
D2
D3
D4
D5
D6
D7
RD*
WR*
ALE
EXC*

DC CONTROLLER PCB (A509)


cs-ipc*
M-Vcc-CAL
STBY*
cs-cal*
AB<16..0>
DB<15..0>
BMWR-B*
BMRD-B*
Q116
UPD4991C
CS*
TP1
TP2
A0
A1
A2
A3
OE*
VSS
VDD
XI
XO
CS
D3
D2
D1
D0
WE*
X2
C115
C116
Q117
M37409M2
CPU-RESET*
X3
R262
C174
C118
err-serial
ipc-int
Q196
R276
+5V
C173
b-cc5-counter
b-reserve-counter
b-deck-pickup-sl
RA109
RA110
RA111
Q203
Q204
Q206
C179
C180
C181
D141
D142
D143
D144
D145
D146
R256
R257
R258
R259
R260
R261
R265
R266
R267
f-sort
to-sort
f-rdf
to-rdf
f-no
to-no
J117 A3
J117 A1
J117 A7
J117 A5
J117 B12
J117 B10
J117 A2 to-sort-gnd
J117 A4 f-sort-gnd
J117 A6 to-rdf-gnd
J117 A8 f-rdf-gnd
J117 A9 CC5-GND
J117 B11 to-no-gnd
J117 B13 f-no-gnd
J117 A14 f-no-vss
J117 A10 CC5-5V
J117 A13 f-no-vcc

DC CONTROLLER PCB (A510)


BMWR-B*
BMRD-B*
Q209
UPD71054G
C183
+5V
CS12-L*
Q119
UPD71054G
CS11-L*
PCKOUT
Q196
DDB<7..0>
AB<2..1>
R130
R124
Q120
b-optical-encorder
C207
A9
fuser-vcc-change
J111
Q216
MANU<04>
R292
C218
R291
C219
Q210
Q121
R125
C117
b-gasaki
C121
Q120
b-home
C120
C172
MANU<00>
MANU<03>
MANU<02>
R126
C122
C119
R277
optical-on-off
1st-on
MANU<00>
C208
Q123
+24vD
D101
Q198
R128
R129
Q110
RGCD
J103
B2
R127
C123
1st-off
MANU<01>
C209
MANU<02>
blank-off
C210
blank-control
Q110
Q123
R131
C124
C211
Q122
MANU<03>
blank-on
C212
C213

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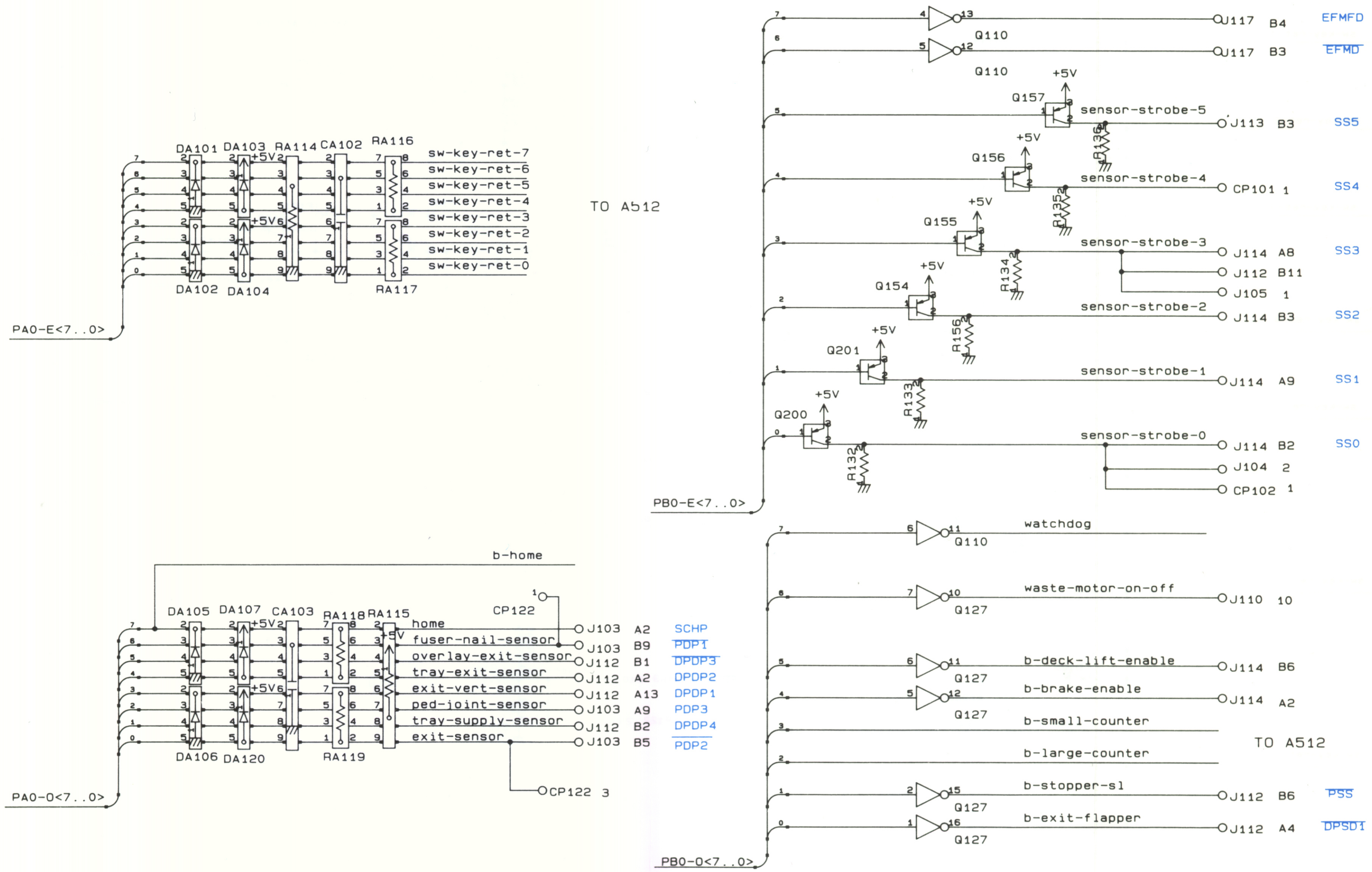
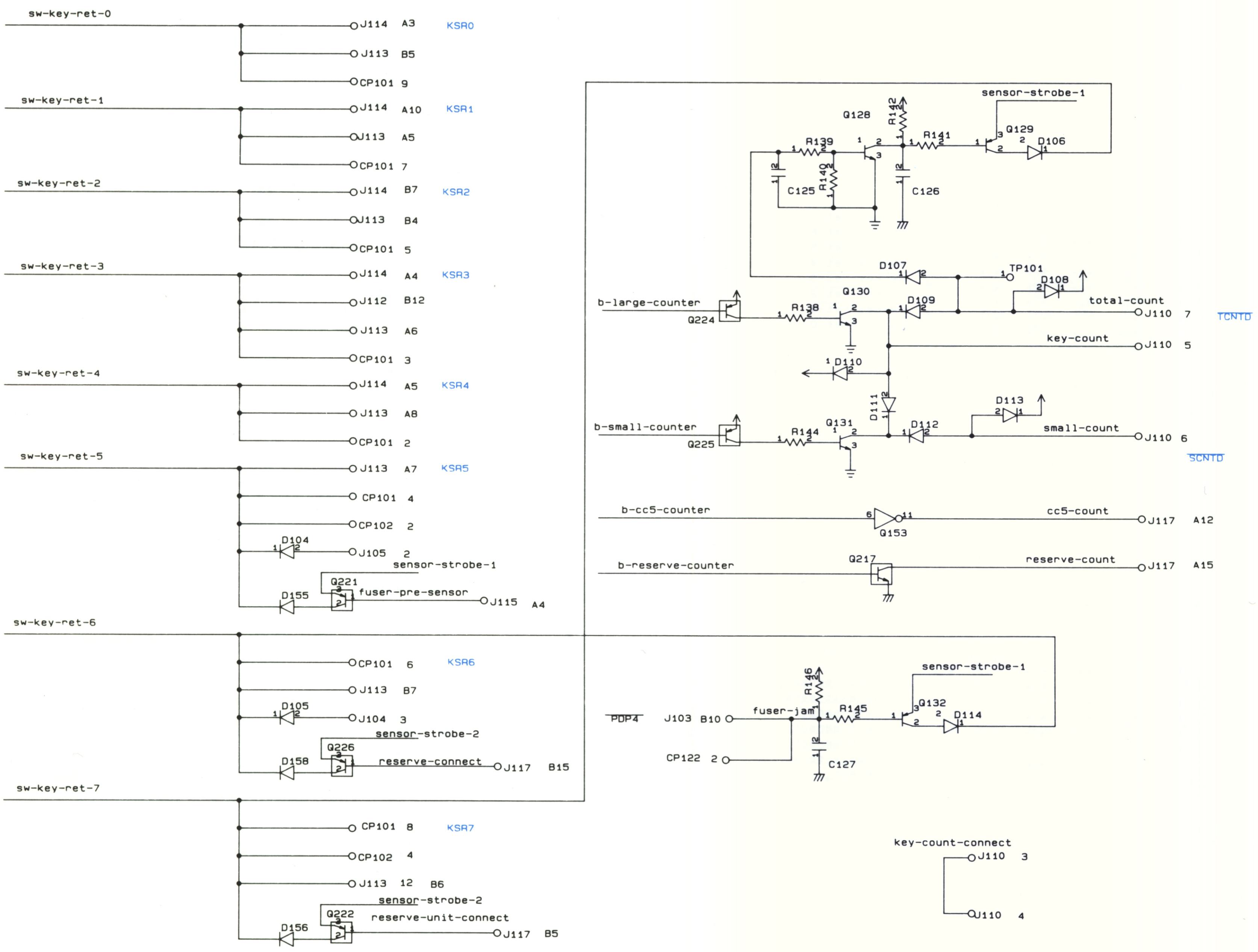
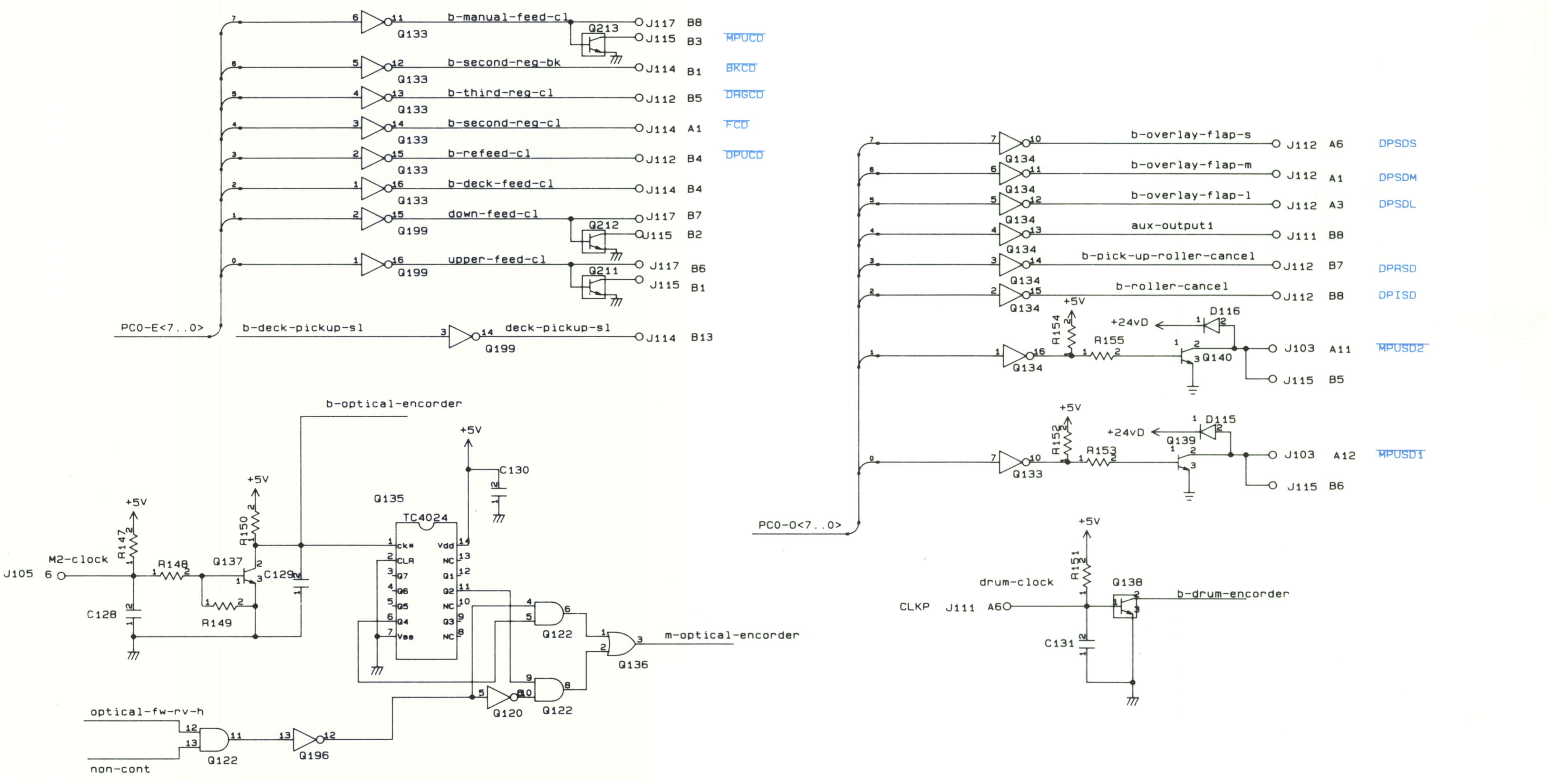
DC CONTROLLER PCB (A511)

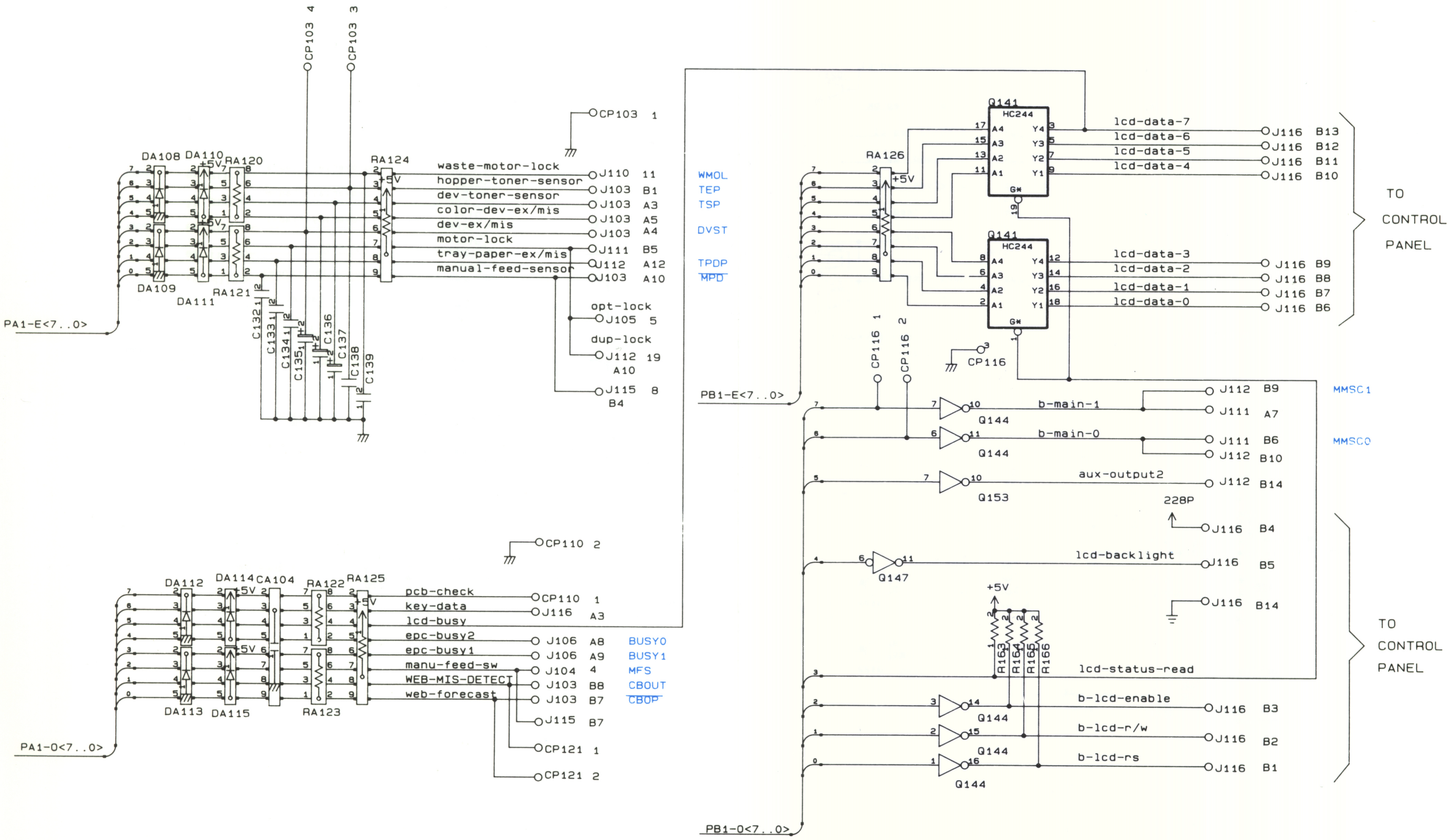

DA101
DA103
RA114
CA102
RA116
DA102
DA104
RA117
+5V
sw-key-ret-7
sw-key-ret-6
sw-key-ret-5
sw-key-ret-4
sw-key-ret-3
sw-key-ret-2
sw-key-ret-1
sw-key-ret-0
PA0-E<7..0>
TO A512
b-home
CP122
DA105
DA107
CA103
RA118
RA115
DA106
DA120
RA119
home
fuser-nail-sensor
overlay-exit-sensor
tray-exit-sensor
exit-vert-sensor
ped-joint-sensor
tray-supply-sensor
exit-sensor
J103 A2 SCHP
J103 B9 PDP1
J112 B1 DPDP3
J112 A2 DPDP2
J112 A13 DPDP1
J103 A9 PDP3
J112 B2 DPDP4
J103 B5 PDP2
CP122 3
PA0-O<7..0>
Q110
J117 B4 EFMFD
J117 B3 EFMD
Q157
Q156
Q155
Q154
Q201
Q200
R136
R135
R134
R156
R133
R132
sensor-strobe-5
sensor-strobe-4
sensor-strobe-3
sensor-strobe-2
sensor-strobe-1
sensor-strobe-0
J113 B3 SS5
CP101 1 SS4
J114 A8 SS3
J112 B11
J105 1
J114 B3 SS2
J114 A9 SS1
J114 B2 SS0
J104 2
CP102 1
PB0-E<7..0>
watchdog
waste-motor-on-off
J110 10
Q127
b-deck-lift-enable
J114 B6
b-brake-enable
J114 A2
b-small-counter
b-large-counter
TO A512
b-stopper-sl
J112 B6 PSS
b-exit-flapper
J112 A4 DPSD1
PB0-O<7..0>

DC CONTROLLER PCB (A512)

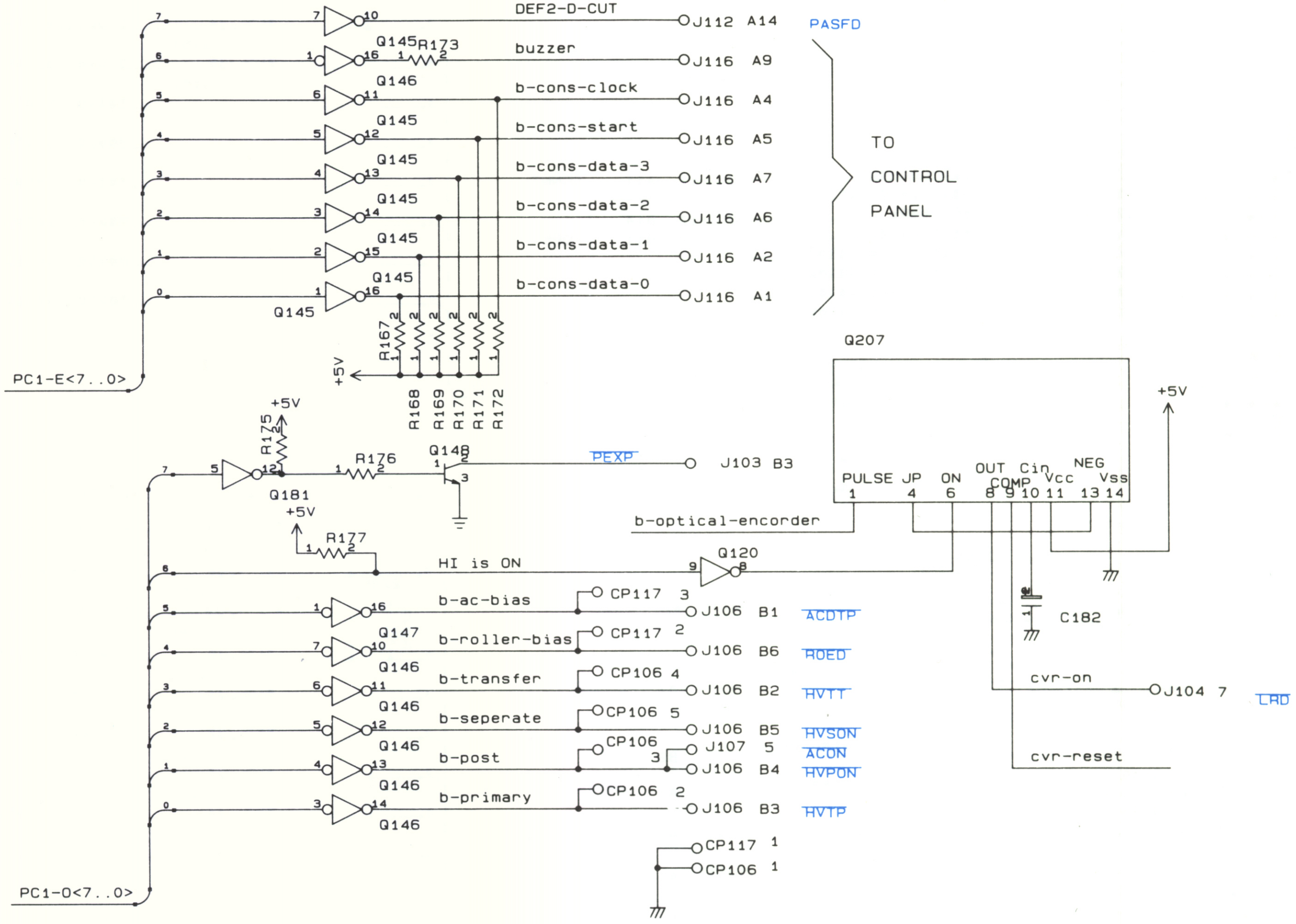

sw-key-ret-0
J114 A3
KSR0
J113 B5
CP101 9
sw-key-ret-1
J114 A10
KSR1
J113 A5
CP101 7
sw-key-ret-2
J114 B7
KSR2
J113 B4
CP101 5
sw-key-ret-3
J114 A4
KSR3
J112 B12
J113 A6
CP101 3
sw-key-ret-4
J114 A5
KSR4
J113 A8
CP101 2
sw-key-ret-5
J113 A7
KSR5
CP101 4
CP102 2
D104
J105 2
sensor-strobe-1
Q221
D155
fuser-pre-sensor
J115 A4
sw-key-ret-6
CP101 6
KSR6
J113 B7
D105
J104 3
sensor-strobe-2
Q226
D158
reserve-connect
J117 B15
sw-key-ret-7
CP101 8
KSR7
CP102 4
J113 12 B6
sensor-strobe-2
Q222
D156
reserve-unit-connect
J117 B5
sensor-strobe-1
Q128
R142
R141
Q129
D106
R139
R140
C125
C126
D107
TP101
D108
total-count
J110 7
TCNTD
b-large-counter
Q224
R138
Q130
D109
key-count
J110 5
D110
D111
D113
b-small-counter
Q225
R144
Q131
D112
small-count
J110 6
SCNTD
b-cc5-counter
Q153
cc5-count
J117 A12
b-reserve-counter
Q217
reserve-count
J117 A15
sensor-strobe-1
PDP4
J103 B10
fuser-jam
R146
R145
Q132
D114
CP122 2
C127
key-count-connect
J110 3
J110 4


PCO-E<7..0>
b-manual-feed-cl
Q133
Q213
J117 B8
J115 B3
MPUCD
b-second-reg-bk
J114 B1
BKCD
b-third-reg-cl
J112 B5
DRGCD
b-second-reg-cl
J114 A1
FCD
b-refeed-cl
J112 B4
DPUCD
b-deck-feed-cl
J114 B4
down-feed-cl
Q199
Q212
J117 B7
J115 B2
upper-feed-cl
Q211
J117 B6
J115 B1
b-deck-pickup-sl
deck-pickup-sl
J114 B13
PCO-O<7..0>
b-overlay-flap-s
Q134
J112 A6
DPSDS
b-overlay-flap-m
J112 A1
DPSDM
b-overlay-flap-l
J112 A3
DPSDL
aux-output1
J111 B8
b-pick-up-roller-cancel
J112 B7
DPASD
b-roller-cancel
J112 B8
DPISD
+5V
R154
R155
+24vD
D116
Q140
J103 A11
MPUSD2
J115 B5
R152
R153
D115
Q139
J103 A12
MPUSD1
J115 B6
b-optical-encorder
J105 6
M2-clock
R147
R148
R149
R150
Q137
C128
C129
C130
Q135
TC4024
ck*
CLR
Q7
Q6
Q5
Q4
Vss
Vdd
NC
Q1
Q2
Q3
Q122
Q136
Q120
m-optical-encorder
optical-fw-rv-h
non-cont
Q196
drum-clock
CLKP J111 A6
R151
Q138
C131
b-drum-encorder

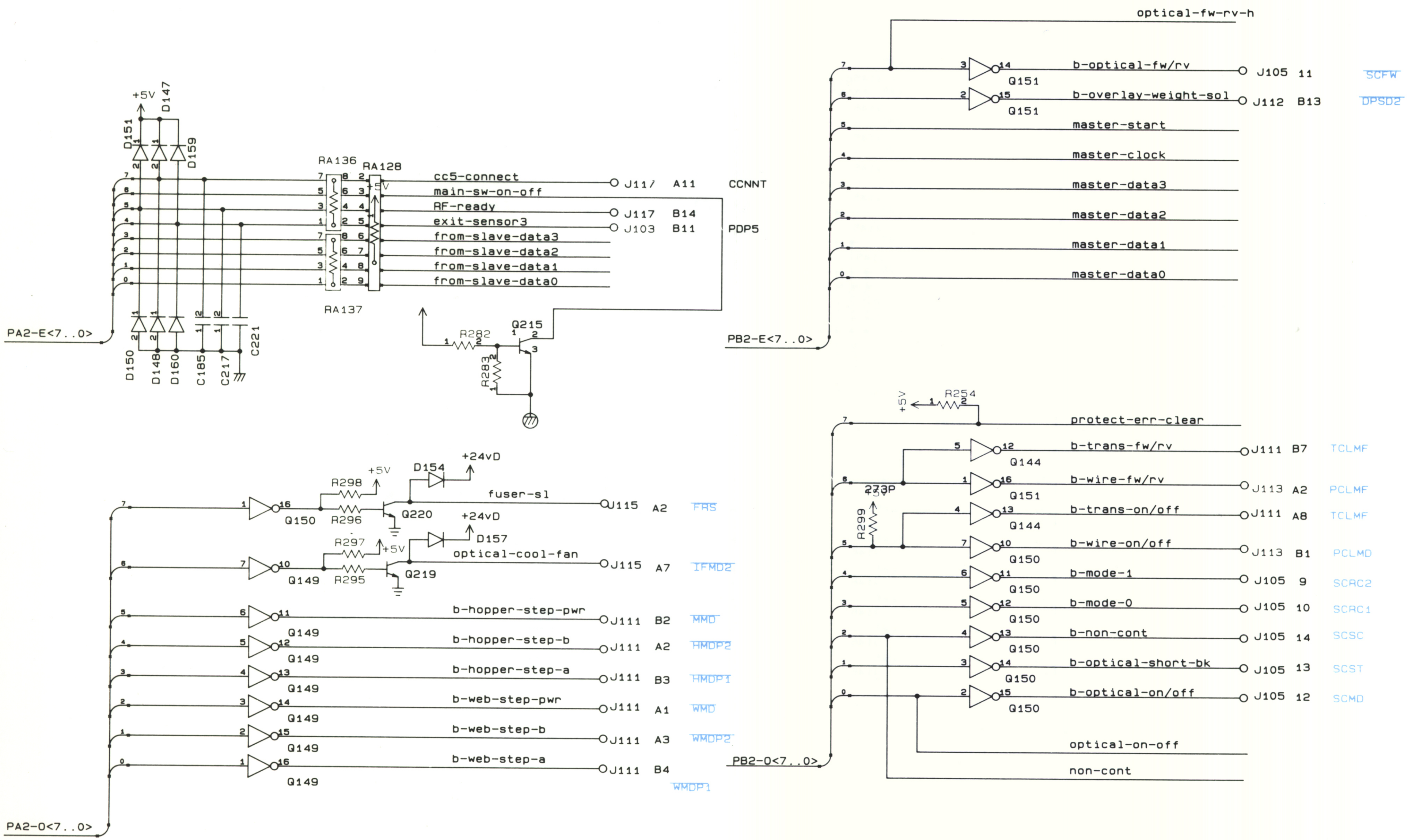
DC CONTROLLER PCB (A514)

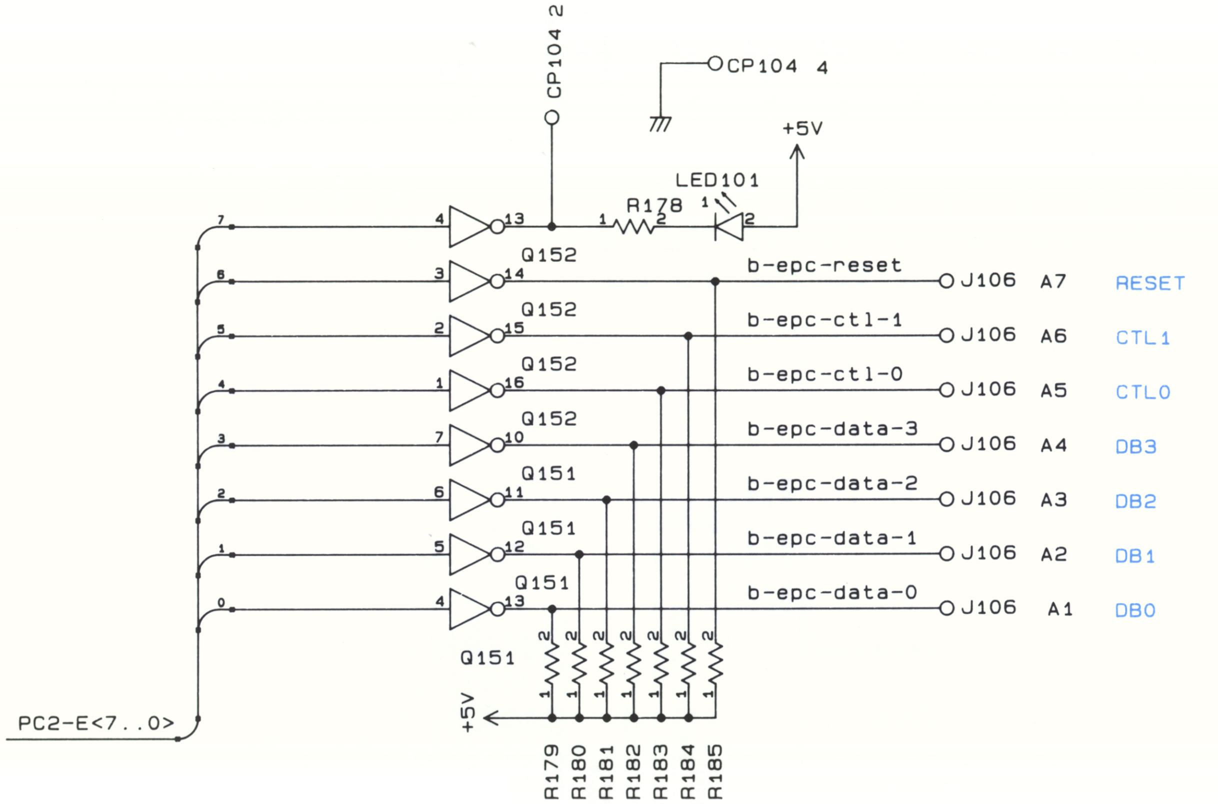


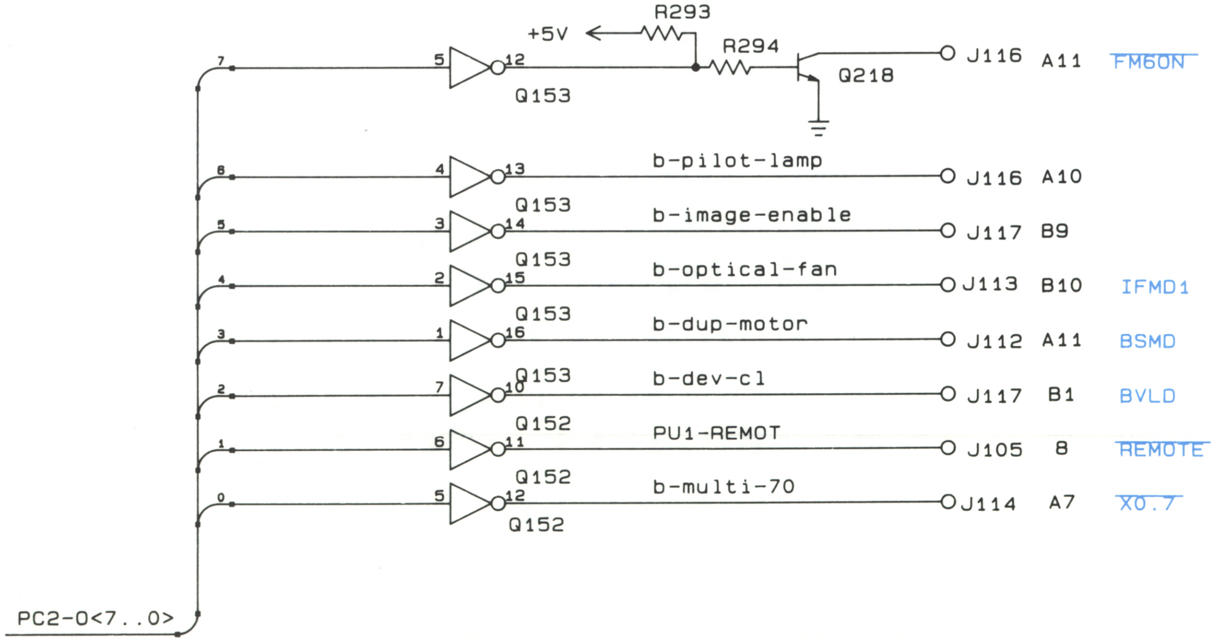
PA1-E<7..0>
DA108
DA109
DA110
DA111
RA120
RA121
RA124
C132
C133
C134
C135
C136
C137
C138
C139
CP103 4
CP103 3
CP103 1
waste-motor-lock
hopper-toner-sensor
dev-toner-sensor
color-dev-ex/mis
dev-ex/mis
motor-lock
tray-paper-ex/mis
manual-feed-sensor
J110 11
J103 B1
J103 A3
J103 A5
J103 A4
J111 B5
J112 A12
J103 A10
opt-lock
J105 5
dup-lock
J112 19
A10
J115 8
B4
WMOL
TEP
TSP
DVST
TPDP
MPD
PA1-O<7..0>
DA112
DA113
DA114
DA115
CA104
RA122
RA123
RA125
CP110 2
pcb-check
key-data
lcd-busy
epc-busy2
epc-busy1
manu-feed-sw
WEB-MIS-DETECT
web-forecast
CP110 1
J116 A3
J106 A8
J106 A9
J104 4
J103 B8
J103 B7
J115 B7
CP121 1
CP121 2
BUSY0
BUSY1
MFS
CBOUT
CBOP
+5V
PB1-E<7..0>
RA126
Q141
HC244
A1
A2
A3
A4
Y1
Y2
Y3
Y4
G*
lcd-data-7
lcd-data-6
lcd-data-5
lcd-data-4
lcd-data-3
lcd-data-2
lcd-data-1
lcd-data-0
J116 B13
J116 B12
J116 B11
J116 B10
J116 B9
J116 B8
J116 B7
J116 B6
TO CONTROL PANEL
CP116 1
CP116 2
CP116 3
PB1-O<7..0>
Q144
Q153
Q147
b-main-1
b-main-0
aux-output2
228P
lcd-backlight
lcd-status-read
b-lcd-enable
b-lcd-r/w
b-lcd-rs
R163
R164
R165
R166
J112 B9
J111 A7
J111 B6
J112 B10
J112 B14
J116 B4
J116 B5
J116 B14
J116 B3
J116 B2
J116 B1
MMSC1
MMSC0
TO CONTROL PANEL


PC1-E<7..0>
Q145
Q146
Q145R173
DEF2-D-CUT
buzzer
b-cons-clock
b-cons-start
b-cons-data-3
b-cons-data-2
b-cons-data-1
b-cons-data-0
J112 A14
J116 A9
J116 A4
J116 A5
J116 A7
J116 A6
J116 A2
J116 A1
PASFD
TO
CONTROL
PANEL
+5V
R167
R168
R169
R170
R171
R172
PC1-O<7..0>
Q181
R175
R176
R177
Q148
PEXP
J103 B3
Q207
PULSE 1
JP 4
ON 6
OUT 8
COMP 9
Cin 10
Vcc 11
NEG 13
Vss 14
b-optical-encorder
HI is ON
Q120
C182
cvr-on
J104 7
LAD
cvr-reset
Q147
b-ac-bias
b-roller-bias
b-transfer
b-seperate
b-post
b-primary
CP117 3
CP117 2
CP106 4
CP106 5
CP106 3
CP106 2
J106 B1
J106 B6
J106 B2
J106 B5
J107 5
J106 B4
J106 B3
ACDTP
ROED
HVTT
HVSON
ACON
HVPON
HVTP
CP117 1
CP106 1

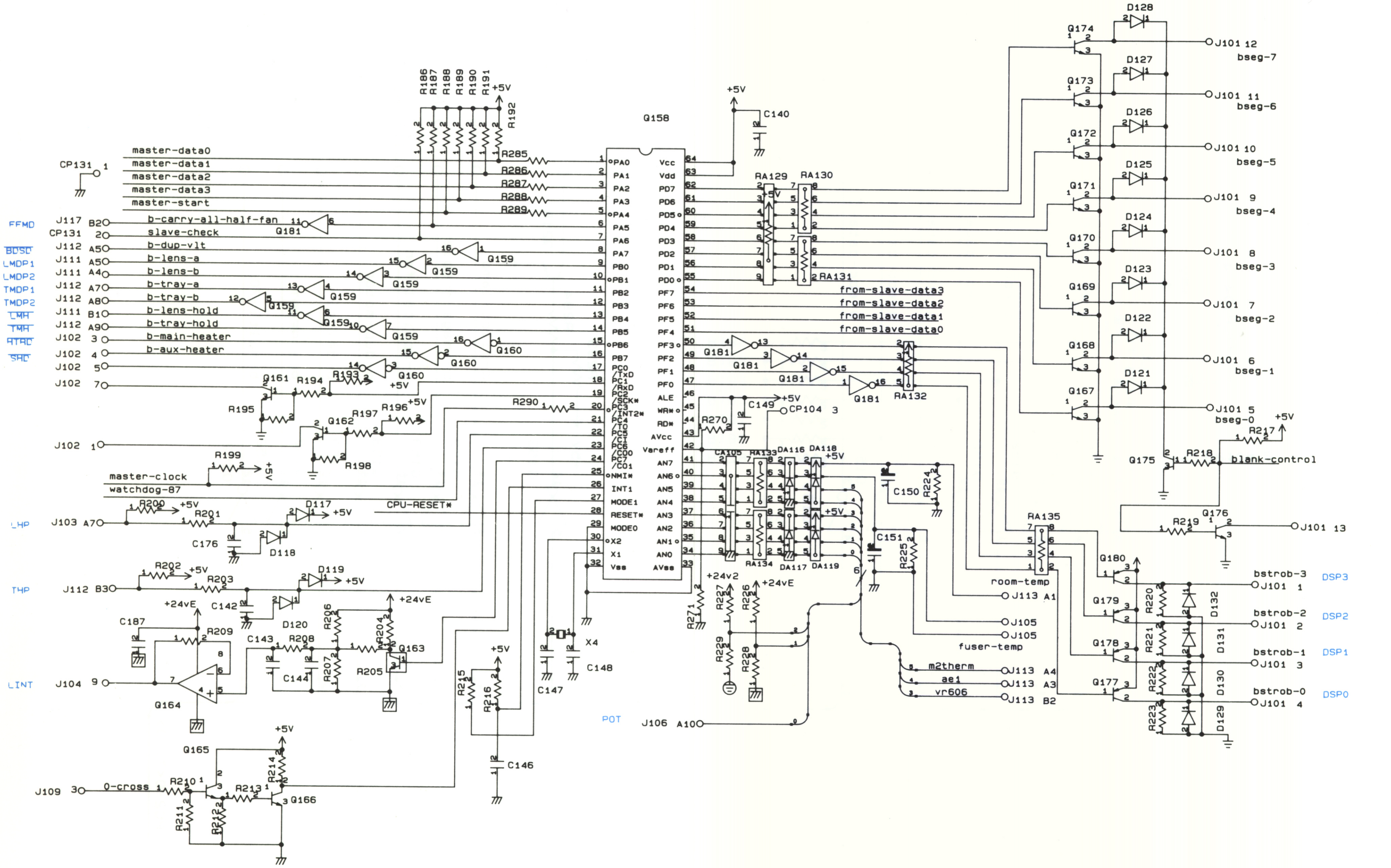
DC CONTROLLER PCB (A516)


optical-fw-rv-h
b-optical-fw/rv
b-overlay-weight-sol
master-start
master-clock
master-data3
master-data2
master-data1
master-data0
Q151
Q151
J105 11
J112 B13
SCFW
DPSD2
PB2-E<7..0>
+5V
D147
D151
D159
RA136
RA128
RA137
cc5-connect
main-sw-on-off
RF-ready
exit-sensor3
from-slave-data3
from-slave-data2
from-slave-data1
from-slave-data0
J117 A11
J117 B14
J103 B11
CCNNT
PDP5
PA2-E<7..0>
D150
D148
D160
C185
C217
C221
R282
R283
Q215
+5V
R254
protect-err-clear
b-trans-fw/rv
b-wire-fw/rv
b-trans-on/off
b-wire-on/off
b-mode-1
b-mode-0
b-non-cont
b-optical-short-bk
b-optical-on/off
optical-on-off
non-cont
Q144
Q151
Q144
Q150
Q150
Q150
Q150
Q150
Q150
273P
R299
J111 B7
J113 A2
J111 A8
J113 B1
J105 9
J105 10
J105 14
J105 13
J105 12
TCLMF
PCLMF
TCLMF
PCLMD
SCAC2
SCAC1
SCSC
SCST
SCMD
PB2-O<7..0>
+5V
R298
R296
D154
+24vD
Q220
Q150
fuser-sl
J115 A2
FRS
R297
R295
+5V
+24vD
D157
Q219
Q149
optical-cool-fan
J115 A7
IFMD2
b-hopper-step-pwr
b-hopper-step-b
b-hopper-step-a
b-web-step-pwr
b-web-step-b
b-web-step-a
Q149
Q149
Q149
Q149
Q149
Q149
J111 B2
J111 A2
J111 B3
J111 A1
J111 A3
J111 B4
MMD
HMDP2
HMDP1
WMD
WMDP2
WMDP1
PA2-O<7..0>

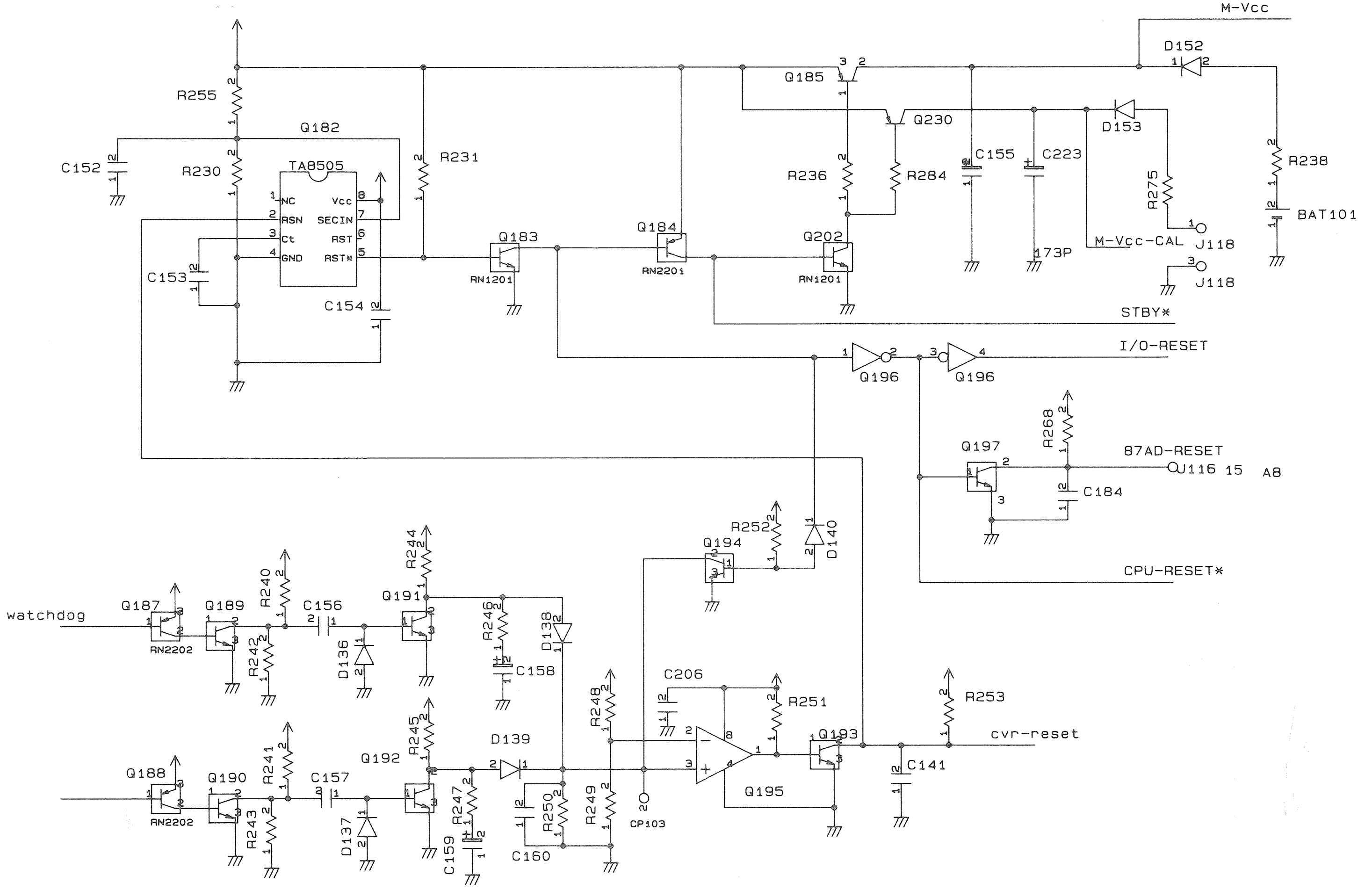

CP104 2
CP104 4
+5V
LED101
R178
Q152
b-epc-reset
J106 A7 RESET
b-epc-ctl-1
J106 A6 CTL1
b-epc-ctl-0
J106 A5 CTL0
b-epc-data-3
J106 A4 DB3
Q151
b-epc-data-2
J106 A3 DB2
b-epc-data-1
J106 A2 DB1
b-epc-data-0
J106 A1 DB0
+5V
R179
R180
R181
R182
R183
R184
R185
PC2-E<7..0>


R293
+5V
R294
Q218
J116 A11 ~~FM6ON~~
Q153
b-pilot-lamp
J116 A10
b-image-enable
J117 B9
b-optical-fan
J113 B10 IFMD1
b-dup-motor
J112 A11 BSMD
b-dev-cl
J117 B1 BVLD
Q152
PU1-REMOT
J105 8 ~~REMOTE~~
b-multi-70
J114 A7 ~~X0.7~~
PC2-O<7..0>

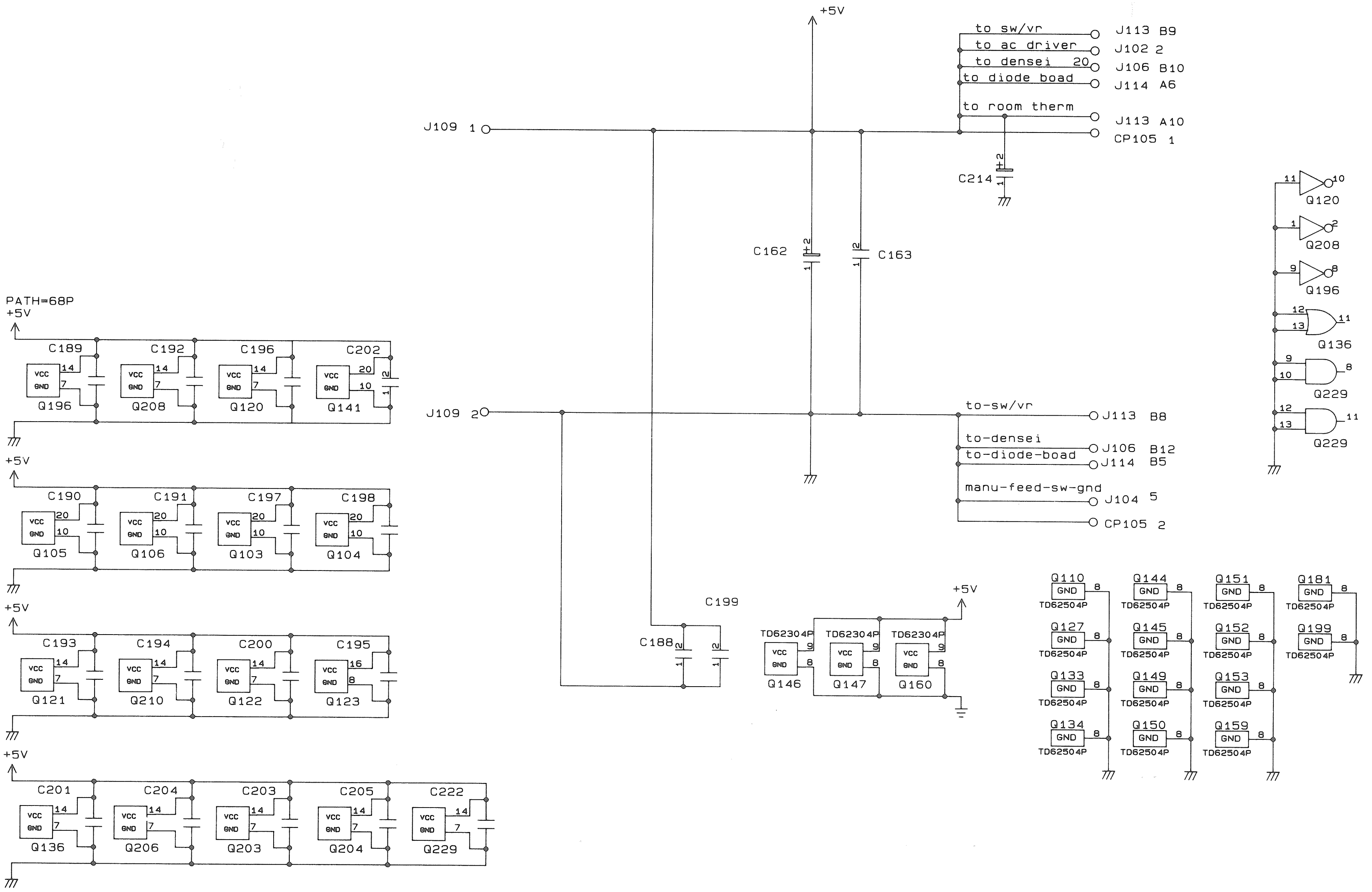
DC CONTROLLER PCB (A518)

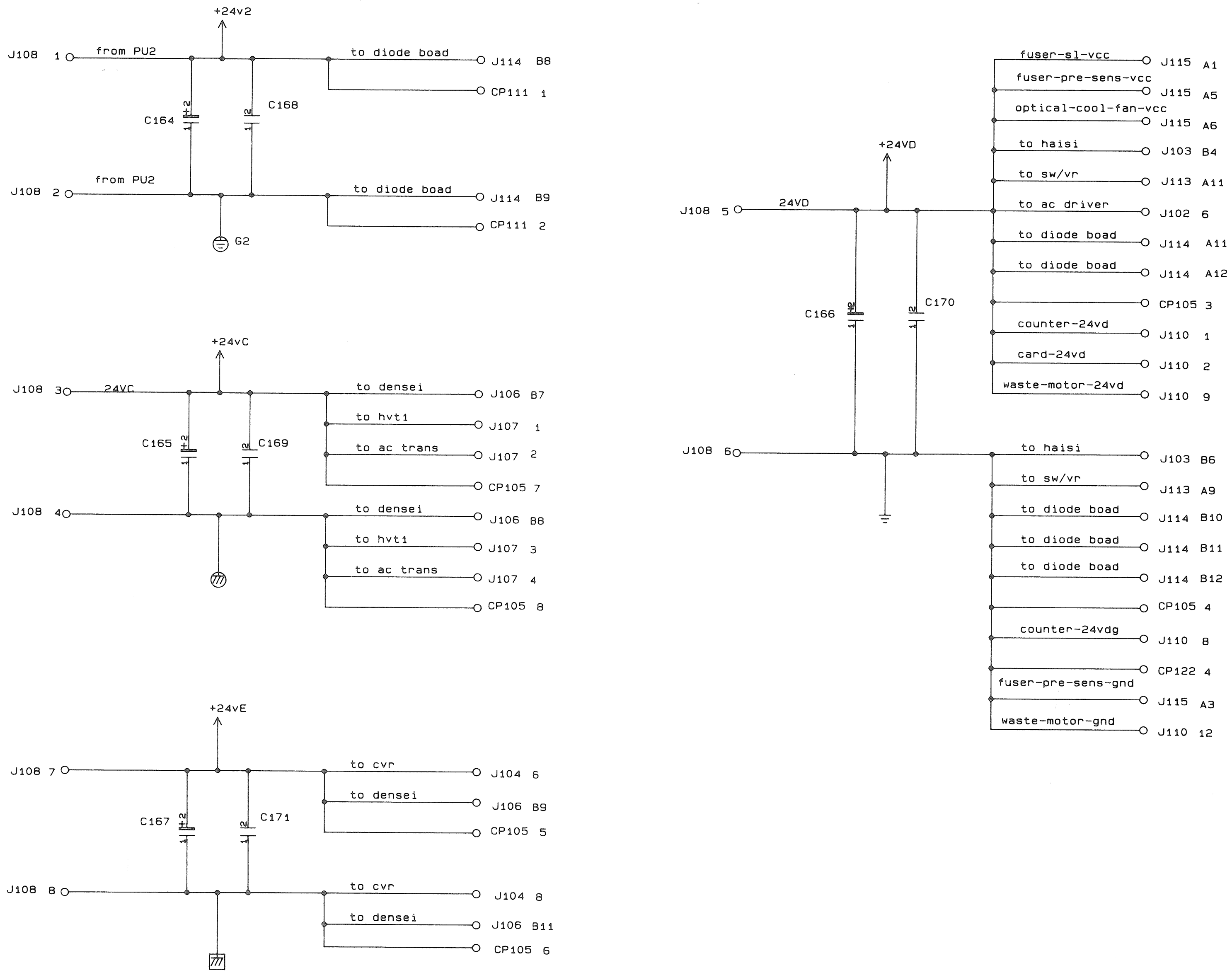

Q158
PA0
PA1
PA2
PA3
PA4
PA5
PA6
PA7
PB0
PB1
PB2
PB3
PB4
PB5
PB6
PB7
PC0 /TxD
PC1 /RxD
PC2 /SCK*
PC3 /INT2*
PC4 /T0
PC5 /CI
PC6 /CO0
PC7 /CO1
NMI*
INT1
MODE1
RESET*
MODE0
X2
X1
Vss
Vcc
Vdd
PD7
PD6
PD5
PD4
PD3
PD2
PD1
PD0
PF7
PF6
PF5
PF4
PF3
PF2
PF1
PF0
ALE
WR*
RD*
AVcc
Varef
AN7
AN6
AN5
AN4
AN3
AN2
AN1
AN0
AVss
CP131 1
master-data0
master-data1
master-data2
master-data3
master-start
FFMD
J117 B2
b-carry-all-half-fan
CP131 2
slave-check
BDSD
J112 A5
b-dup-vlt
LMDP1
J111 A5
b-lens-a
LMDP2
J111 A4
b-lens-b
TMDP1
J112 A7
b-tray-a
TMDP2
J112 A8
b-tray-b
LMH
J111 B1
b-lens-hold
TMH
J112 A9
b-tray-hold
ATHC
J102 3
b-main-heater
SHC
J102 4
b-aux-heater
J102 5
J102 7
J102 1
master-clock
watchdog-87
CPU-RESET*
LHP
J103 A7
THP
J112 B3
LINT
J104 9
J109 3
0-cross
POT
J106 A10
R186
R187
R188
R189
R190
R191
R192
R285
R286
R287
R288
R289
R290
R193
R194
R195
R196
R197
R198
R199
R200
R201
R202
R203
R204
R205
R206
R207
R208
R209
R210
R211
R212
R213
R214
R215
R216
R217
R218
R219
R220
R221
R222
R223
R224
R225
R226
R227
R228
R229
R270
R271
Q159
Q160
Q161
Q162
Q163
Q164
Q165
Q166
Q167
Q168
Q169
Q170
Q171
Q172
Q173
Q174
Q175
Q176
Q177
Q178
Q179
Q180
Q181
C140
C142
C143
C144
C146
C147
C148
C149
C150
C151
C176
C187
D117
D118
D119
D120
D121
D122
D123
D124
D125
D126
D127
D128
D129
D130
D131
D132
X4
RA129
RA130
RA131
RA132
RA133
RA134
RA135
CA105
DA116
DA117
DA118
DA119
CP104 3
+5V
+24vE
+24v2
from-slave-data3
from-slave-data2
from-slave-data1
from-slave-data0
J101 12
bseg-7
J101 11
bseg-6
J101 10
bseg-5
J101 9
bseg-4
J101 8
bseg-3
J101 7
bseg-2
J101 6
bseg-1
J101 5
bseg-0
blank-control
J101 13
room-temp
J113 A1
J105
J105
fuser-temp
m2therm
J113 A4
ae1
J113 A3
vr606
J113 B2
bstrob-3
J101 1
DSP3
bstrob-2
J101 2
DSP2
bstrob-1
J101 3
DSP1
bstrob-0
J101 4
DSP0

CANON NP-8530 REV.0 NOV. 1990 PRINTED IN JAPAN (IMPRIME AU JAPON)


M-Vcc
D152
R238
BAT101
Q185
Q230
D153
R255
Q182
C152
R230
TA8505
NC
RSN
Ct
GND
Vcc
SECIN
RST
RST*
C153
C154
R231
Q183
RN1201
Q184
RN2201
R236
R284
Q202
RN1201
C155
C223
173P
R275
M-Vcc-CAL
J118
J118
STBY*
I/O-RESET
Q196
Q196
Q197
R268
87AD-RESET
J116 15
A8
C184
CPU-RESET*
R252
Q194
D140
watchdog
Q187
RN2202
Q189
R240
R242
C156
D136
Q191
R244
R246
C158
D138
Q188
RN2202
Q190
R241
R243
C157
D137
Q192
R245
R247
C159
D139
C160
R250
R248
R249
CP103
C206
R251
Q195
Q193
R253
C141
cvr-reset

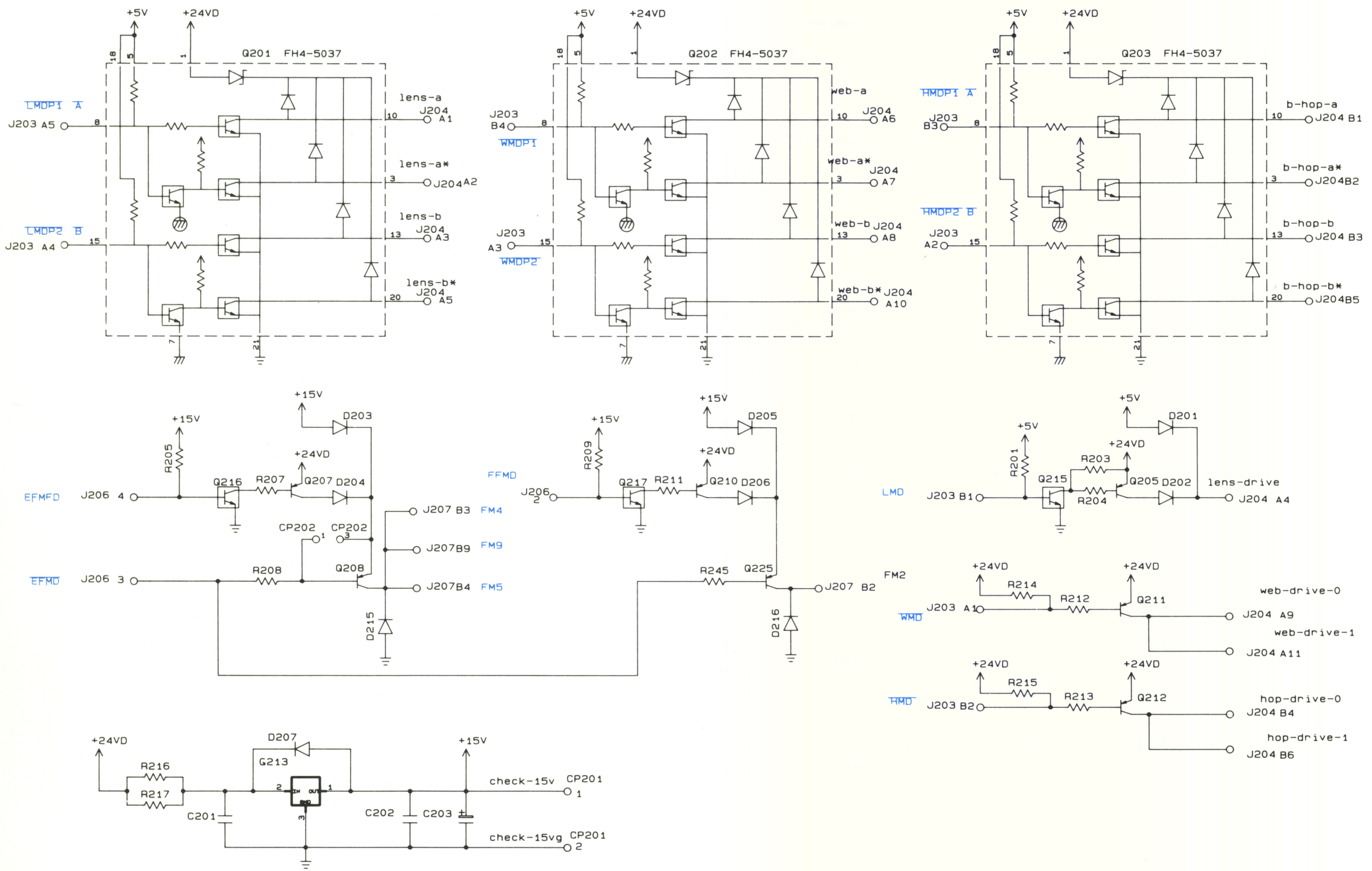
DC CONTROLLER PCB (A520)


+5V
J109 1
J109 2
to sw/vr
to ac driver
to densei 20
to diode boad
to room therm
J113 B9
J102 2
J106 B10
J114 A6
J113 A10
CP105 1
C214
C162
C163
to-sw/vr
to-densei
to-diode-boad
manu-feed-sw-gnd
J113 B8
J106 B12
J114 B5
J104 5
CP105 2
C188
C199
PATH=68P
C189
C192
C196
C202
Q196
Q208
Q120
Q141
C190
C191
C197
C198
Q105
Q106
Q103
Q104
C193
C194
C200
C195
Q121
Q210
Q122
Q123
C201
C204
C203
C205
C222
Q136
Q206
Q203
Q204
Q229
VCC
GND
TD62304P
Q146
Q147
Q160
Q110
Q144
Q151
Q181
Q127
Q145
Q152
Q199
Q133
Q149
Q153
Q134
Q150
Q159
TD62504P
Q120
Q208
Q196
Q136
Q229
Q229

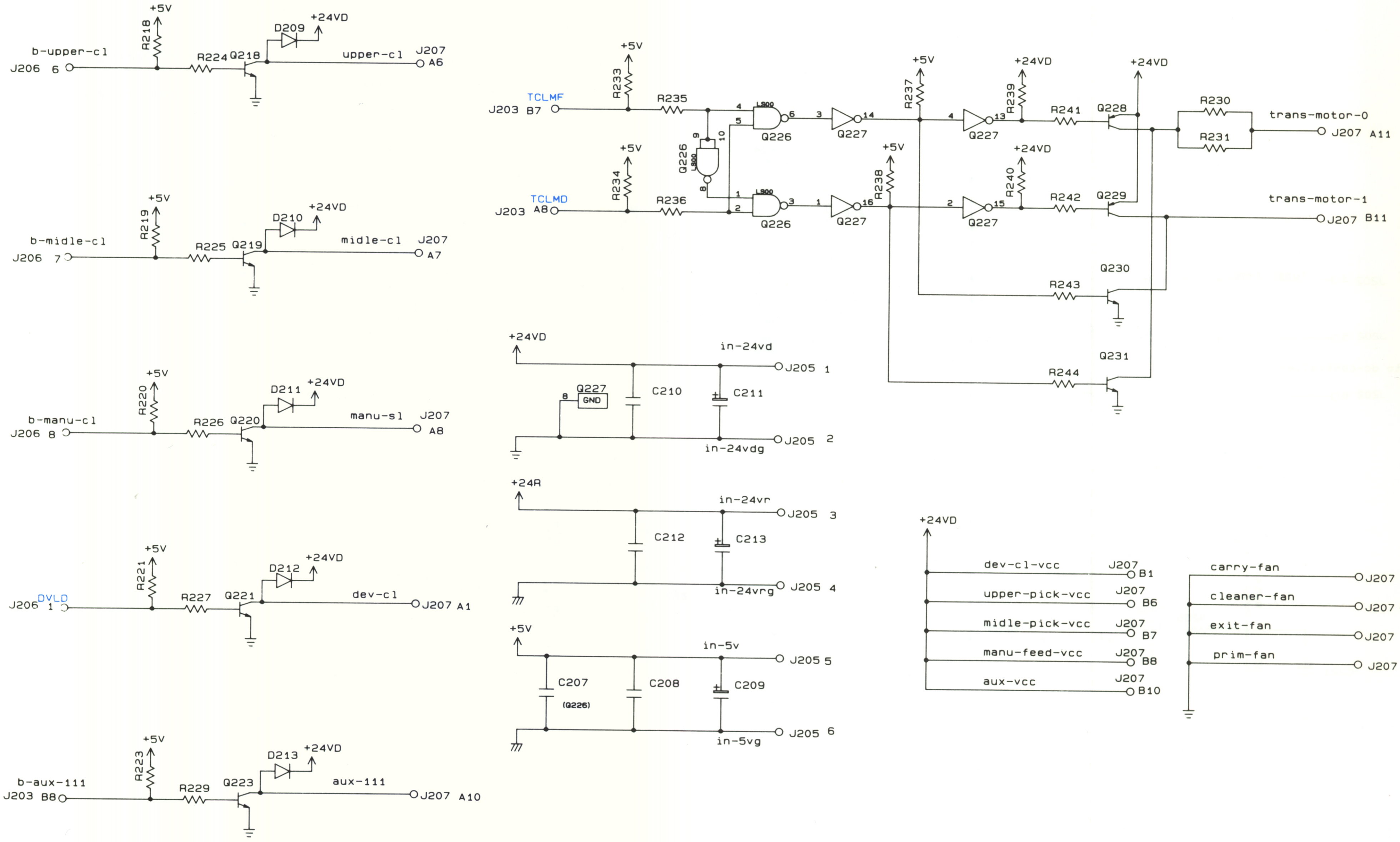

+24v2
J108 1
from PU2
to diode boad
J114 B8
CP111 1
C164
C168
J108 2
from PU2
to diode boad
J114 B9
CP111 2
G2
+24vC
J108 3
24VC
to densei
J106 B7
to hvt1
J107 1
to ac trans
J107 2
CP105 7
C165
C169
J108 4
to densei
J106 B8
to hvt1
J107 3
to ac trans
J107 4
CP105 8
+24vE
J108 7
to cvr
J104 6
to densei
J106 B9
CP105 5
C167
C171
J108 8
to cvr
J104 8
to densei
J106 B11
CP105 6
+24VD
J108 5
24VD
C166
C170
fuser-sl-vcc
J115 A1
fuser-pre-sens-vcc
J115 A5
optical-cool-fan-vcc
J115 A6
to haisi
J103 B4
to sw/vr
J113 A11
to ac driver
J102 6
to diode boad
J114 A11
to diode boad
J114 A12
CP105 3
counter-24vd
J110 1
card-24vd
J110 2
waste-motor-24vd
J110 9
J108 6
to haisi
J103 B6
to sw/vr
J113 A9
to diode boad
J114 B10
to diode boad
J114 B11
to diode boad
J114 B12
CP105 4
counter-24vdg
J110 8
CP122 4
fuser-pre-sens-gnd
J115 A3
waste-motor-gnd
J110 12

E. DC DRIVER CIRCUIT DIAGRAM

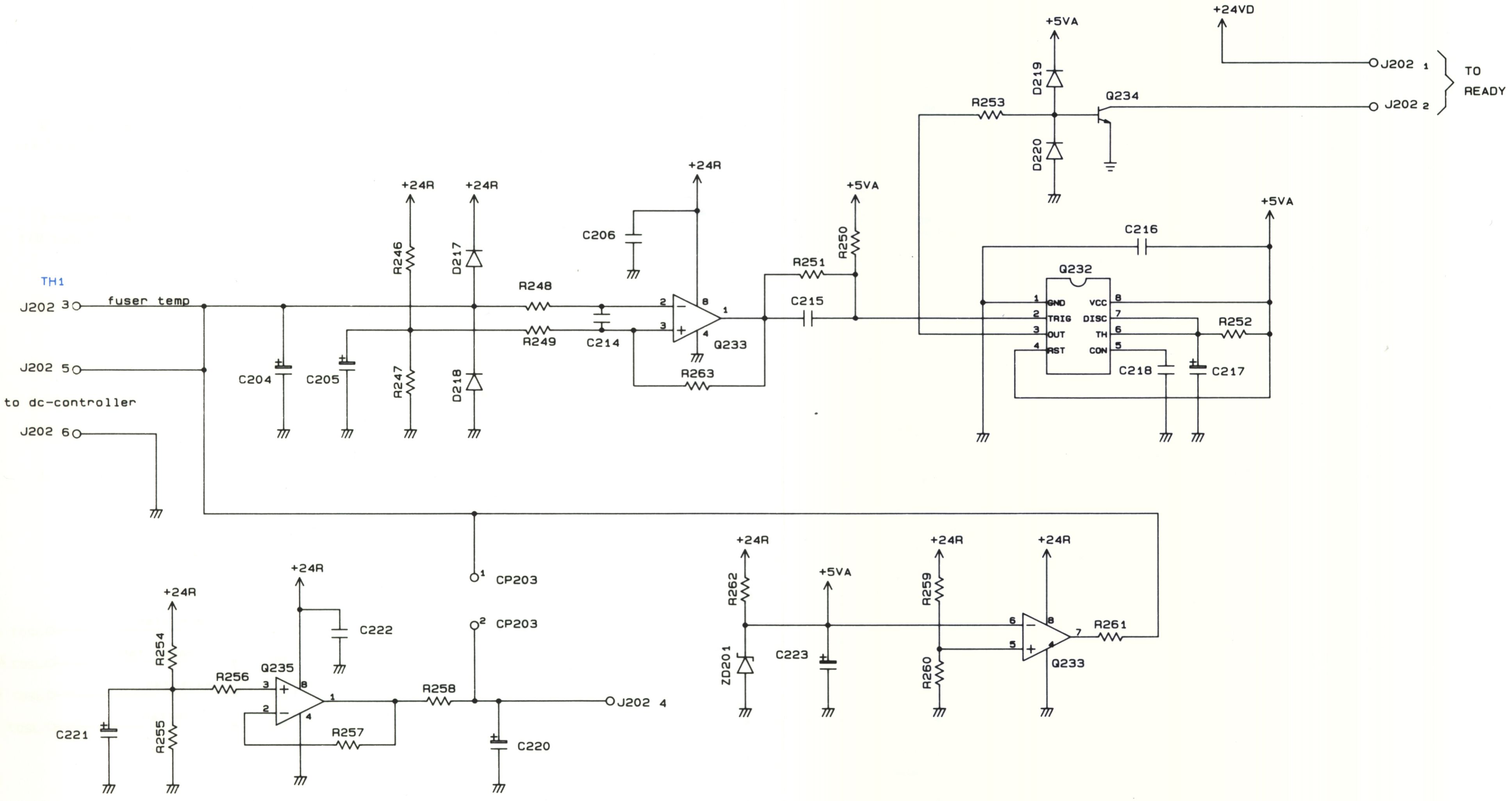
DC DRIVER PCB (1/3)


+5V
+24VD
Q201 FH4-5037
LMDP1 A
J203 A5
LMDP2 B
J203 A4
lens-a
J204 A1
lens-a*
J204A2
lens-b
J204 A3
lens-b*
J204 A5
Q202 FH4-5037
J203 B4
WMDP1
J203 A3
WMDP2
web-a
J204 A6
web-a*
J204 A7
web-b
J204 A8
web-b*
J204 A10
Q203 FH4-5037
HMDP1 A
J203 B3
HMDP2 B
J203 A2
b-hop-a
J204 B1
b-hop-a*
J204B2
b-hop-b
J204 B3
b-hop-b*
J204B5
18
5
1
8
15
10
3
13
20
7
21
+15V
R205
EFMFD
J206 4
Q216
R207
Q207
D203
D204
+24VD
EFMD
J206 3
R208
CP202
Q208
J207 B3
FM4
J207B9
FM9
J207B4
FM5
D215
FFMD
J206 2
R209
Q217
R211
Q210
D205
D206
R245
Q225
J207 B2
FM2
D216
LMD
J203 B1
R201
Q215
R203
R204
Q205
D201
D202
lens-drive
J204 A4
WMD
J203 A1
R214
R212
Q211
web-drive-0
J204 A9
web-drive-1
J204 A11
HMD
J203 B2
R215
R213
Q212
hop-drive-0
J204 B4
hop-drive-1
J204 B6
R216
R217
C201
D207
G213
C202
C203
check-15v
CP201
check-15vg

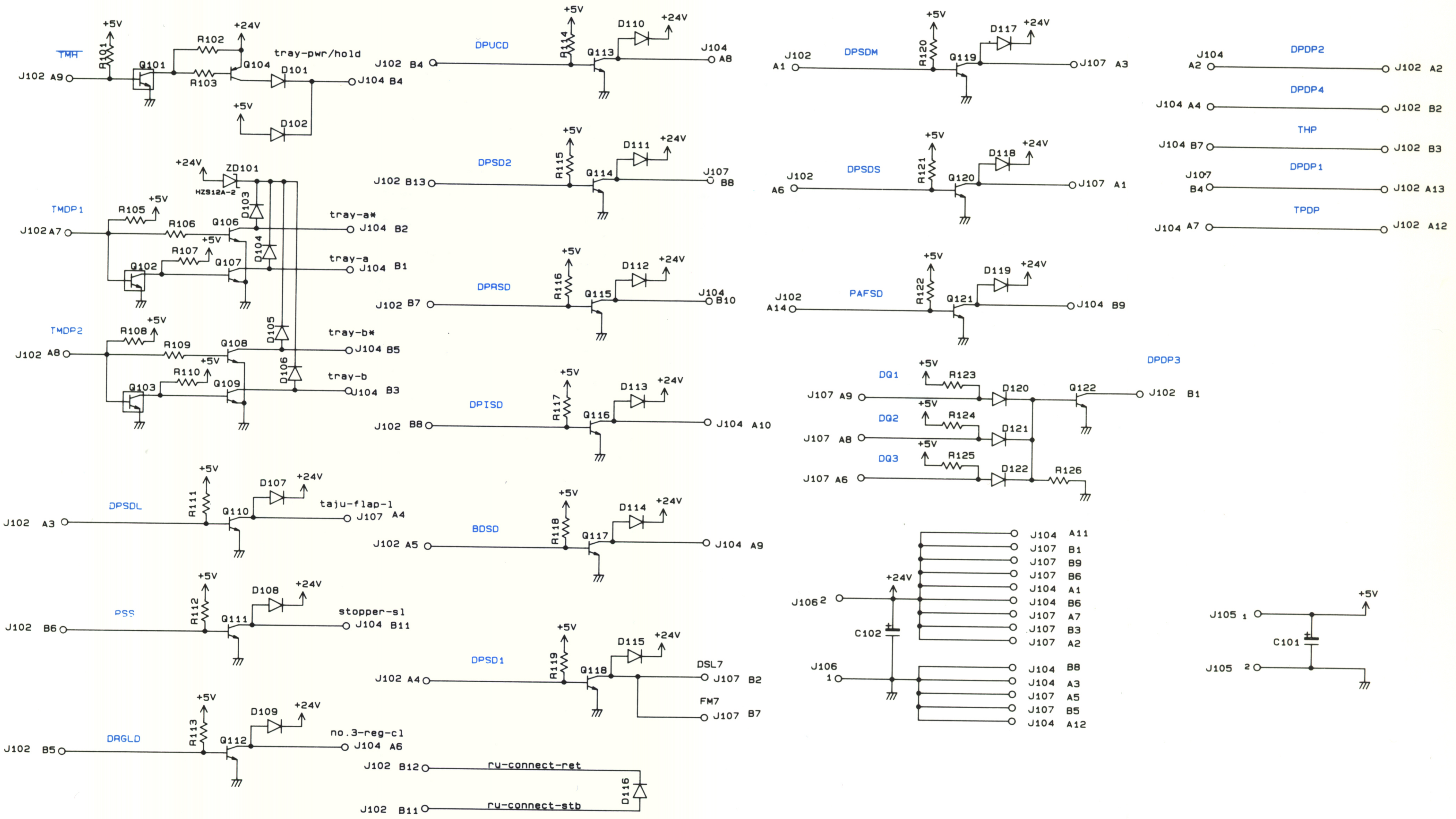
DC DRIVER PCB (2/3)


b-upper-cl
J206 6
R218
+5V
R224
Q218
D209
+24VD
upper-cl
J207 A6
b-midle-cl
J206 7
R219
R225
Q219
D210
midle-cl
J207 A7
b-manu-cl
J206 8
R220
R226
Q220
D211
manu-sl
J207 A8
DVLD
J206 1
R221
R227
Q221
D212
dev-cl
J207 A1
b-aux-111
J203 B8
R223
R229
Q223
D213
aux-111
J207 A10
TCLMF
J203 B7
R233
R235
TCLMD
J203 A8
R234
R236
Q226
LS00
4
5
6
9
10
8
1
2
3
Q227
14
16
R237
R238
13
15
R239
R240
R241
R242
Q228
Q229
R230
R231
trans-motor-0
J207 A11
trans-motor-1
J207 B11
Q230
R243
Q231
R244
+24VD
in-24vd
J205 1
Q227
8
GND
C210
C211
in-24vdg
J205 2
+24R
in-24vr
J205 3
C212
C213
in-24vrg
J205 4
+5V
in-5v
J205 5
C207
(Q226)
C208
C209
in-5vg
J205 6
dev-cl-vcc
J207 B1
upper-pick-vcc
J207 B6
midle-pick-vcc
J207 B7
manu-feed-vcc
J207 B8
aux-vcc
J207 B10
carry-fan
J207 A2
cleaner-fan
J207 A3
exit-fan
J207 A4
prim-fan
J207 A9

DC DRIVER PCB (3/3)


TH1
J202 3
fuser temp
J202 5
to dc-controller
J202 6
C204
C205
+24R
R246
R247
+24R
D217
D218
R248
R249
C214
C206
+24R
Q233
R263
+5VA
R250
R251
C215
Q232
GND
TRIG
OUT
RST
VCC
DISC
TH
CON
C216
+5VA
R252
C218
C217
R253
+5VA
D219
D220
Q234
+24VD
J202 1
J202 2
TO READY
CP203
CP203
+24R
R254
R255
C221
R256
Q235
+24R
C222
R257
R258
C220
J202 4
+24R
R262
ZD201
+5VA
C223
+24R
R259
R260
+24R
Q233
R261

F. DUPLEXING DRIVER CIRCUIT DIAGRAM


TMH
J102 A9
R101
+5V
Q101
R102
R103
+24V
Q104
D101
tray-pwr/hold
J104 B4
D102
TMDP1
J102 A7
R105
R106
Q106
R107
Q107
Q102
ZD101
HZS12A-2
D103
D104
tray-a*
J104 B2
tray-a
J104 B1
TMDP2
J102 A8
R108
R109
Q108
R110
Q109
Q103
D105
D106
tray-b*
J104 B5
tray-b
J104 B3
DPSDL
J102 A3
R111
Q110
D107
taju-flap-l
J107 A4
PSS
J102 B6
R112
Q111
D108
stopper-sl
J104 B11
DRGLD
J102 B5
R113
Q112
D109
no.3-reg-cl
J104 A6
DPUCD
J102 B4
R114
Q113
D110
J104 A8
DPSD2
J102 B13
R115
Q114
D111
J107 B8
DPRSD
J102 B7
R116
Q115
D112
J104 B10
DPISD
J102 B8
R117
Q116
D113
J104 A10
BDSD
J102 A5
R118
Q117
D114
J104 A9
DPSD1
J102 A4
R119
Q118
D115
DSL7
J107 B2
FM7
J107 B7
J102 B12
ru-connect-ret
J102 B11
ru-connect-stb
D116
DPSDM
J102 A1
R120
Q119
D117
J107 A3
DPSDS
J102 A6
R121
Q120
D118
J107 A1
PAFSD
J102 A14
R122
Q121
D119
J104 B9
DQ1
J107 A9
R123
D120
DQ2
J107 A8
R124
D121
DQ3
J107 A6
R125
D122
R126
Q122
DPDP3
J102 B1
J106 2
J106 1
C102
+24V
J104 A11
J107 B1
J107 B9
J107 B6
J104 A1
J104 B6
J107 A7
J107 B3
J107 A2
J104 B8
J104 A3
J107 A5
J107 B5
J104 A12
J104 A2
DPDP2
J102 A2
J104 A4
DPDP4
J102 B2
J104 B7
THP
J102 B3
J107 B4
DPDP1
J102 A13
J104 A7
TPDP
J102 A12
J105 1
J105 2
C101
+5V

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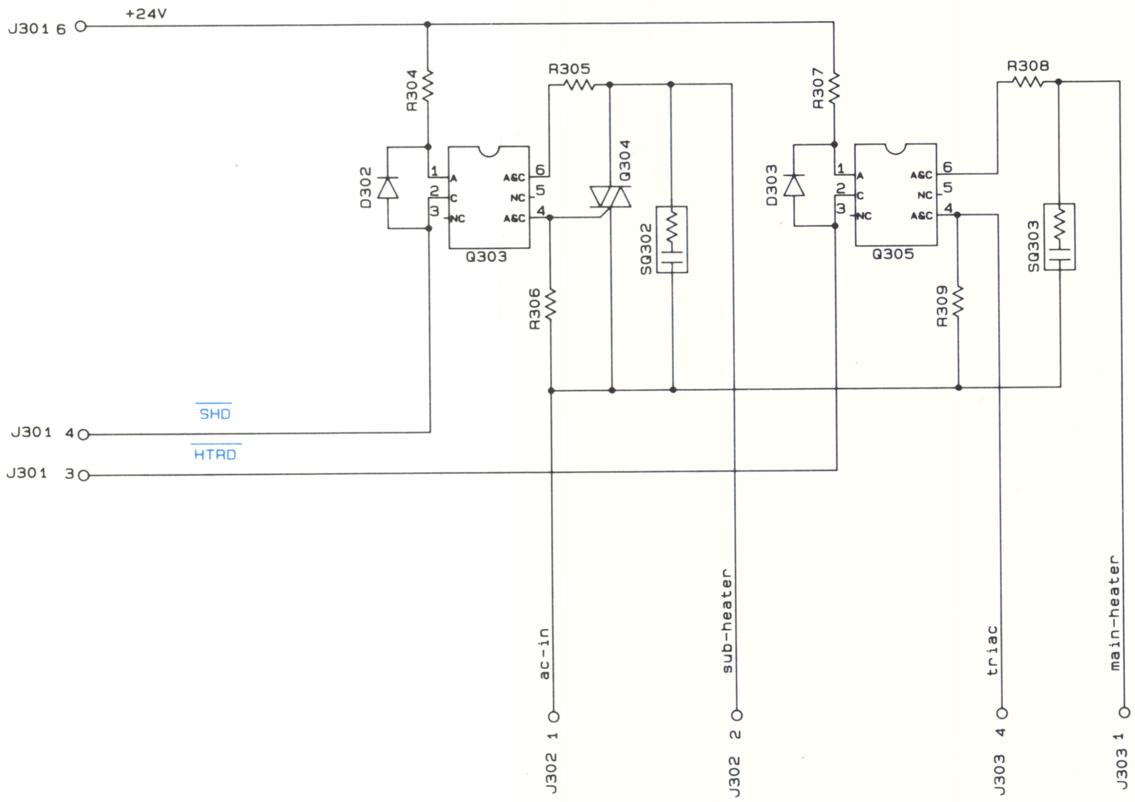
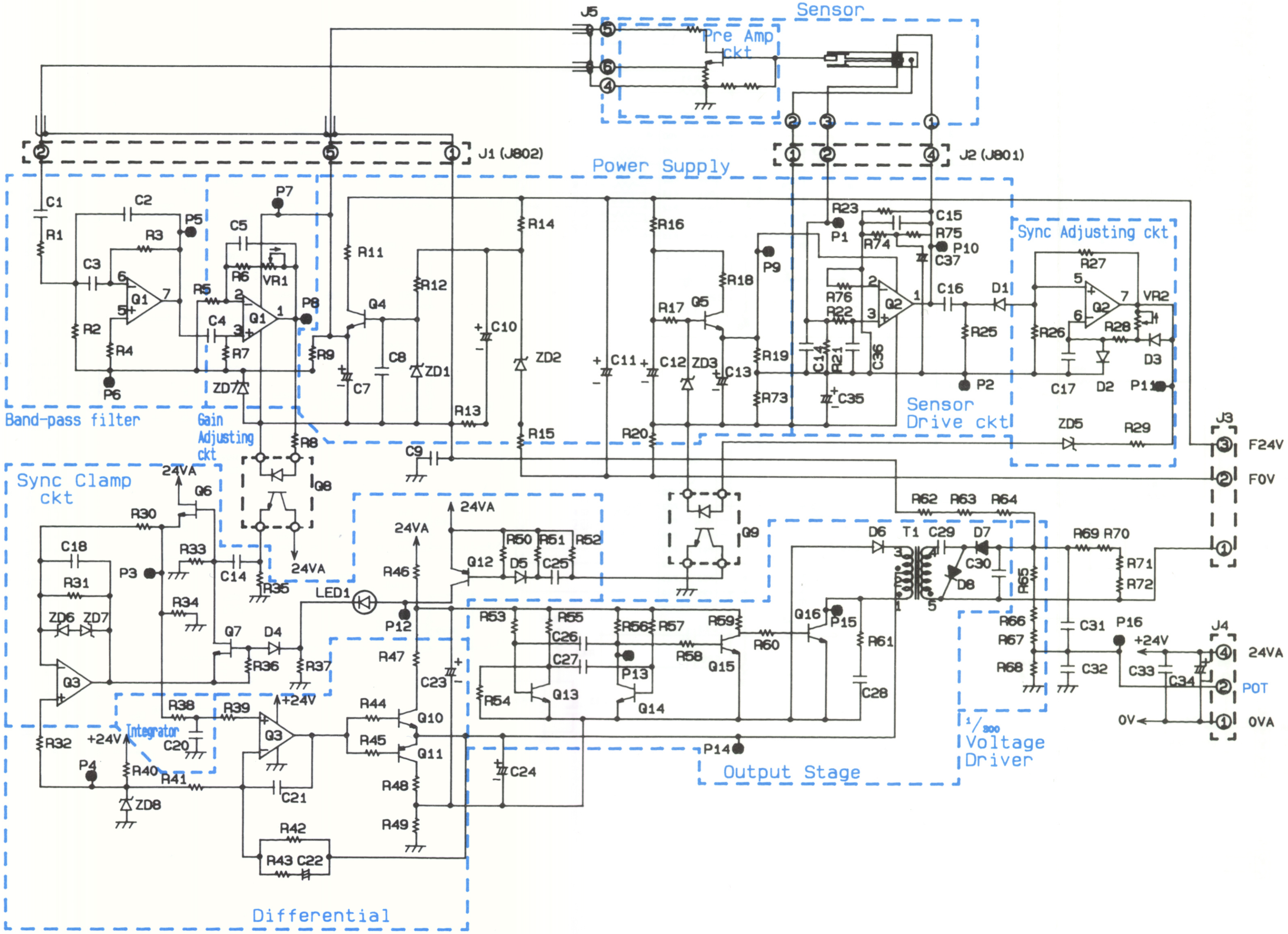
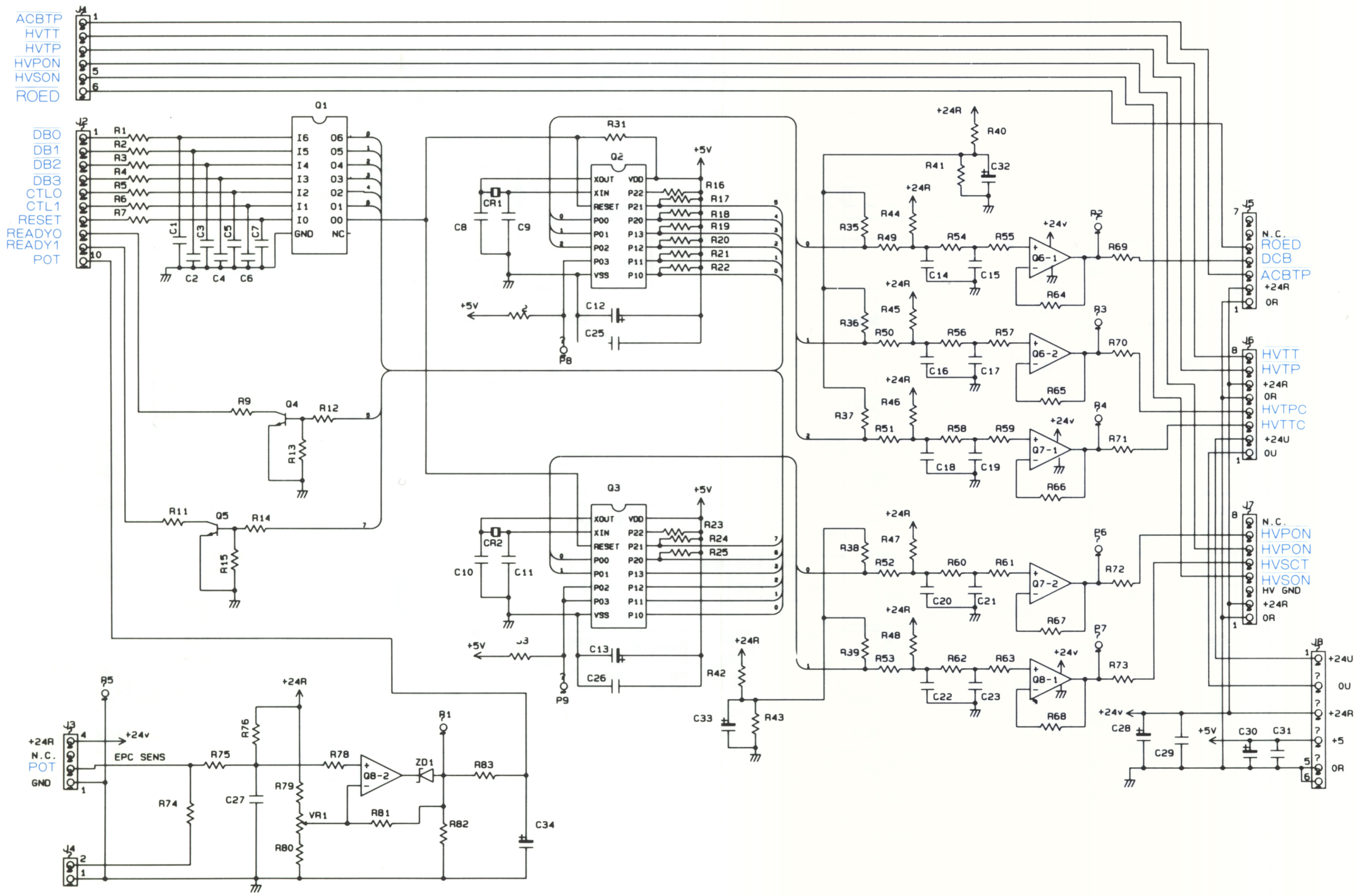
G. AC DRIVER CIRCUIT DIAGRAM


J301 6
+24V
J301 4
$\overline{SHD}$
J301 3
$\overline{HTRD}$
R304
D302
Q303
A
C
NC
A&C
NC
A&C
1
2
3
4
5
6
R305
R306
Q304
SQ302
R307
D303
Q305
R308
R309
SQ303
ac-in
sub-heater
triac
main-heater
J302 1
J302 2
J303 4
J303 1

H. POTENTIAL MEASURING CIRCUIT DIAGRAM


Sensor
Pre Amp ckt
J5
J1 (J802)
J2 (J801)
Power Supply
Band-pass filter
Gain Adjusting ckt
Sync Adjusting ckt
Sensor Drive ckt
Sync Clamp ckt
Integrator
Differential
Output Stage
1/300 Voltage Driver
J3
F24V
F0V
J4
24VA
POT
0VA
0V
+24V
24VA
LED1
T1
Q1
Q2
Q3
Q4
Q5
Q6
Q7
Q8
Q9
Q10
Q11
Q12
Q13
Q14
Q15
Q16
VR1
VR2

I. POTENTIAL CONTROL CIRCUIT DIAGRAM


J1
ACBTP
HVTT
HVTP
HVPON
HVSON
ROED
J2
DB0
DB1
DB2
DB3
CTL0
CTL1
RESET
READY0
READY1
POT
R1
R2
R3
R4
R5
R6
R7
C1
C2
C3
C4
C5
C6
C7
Q1
I6
I5
I4
I3
I2
I1
I0
GND
06
05
04
03
02
01
00
NC
Q2
XOUT
XIN
RESET
P00
P01
P02
P03
VSS
VDD
P22
P21
P20
P13
P12
P11
P10
R31
CR1
C8
C9
+5V
R16
R17
R18
R19
R20
R21
R22
C12
C25
P8
R9
Q4
R12
R13
R11
Q5
R14
R15
Q3
CR2
C10
C11
R23
R24
R25
J3
C13
C26
P9
R42
R43
C33
+24R
R40
R41
C32
R44
R35
R49
R54
R55
C14
C15
Q6-1
+24v
P2
R69
R64
R45
R36
R50
R56
R57
C16
C17
Q6-2
P3
R70
R65
R46
R37
R51
R58
R59
C18
C19
Q7-1
P4
R71
R66
R47
R38
R52
R60
R61
C20
C21
Q7-2
P6
R72
R67
R48
R39
R53
R62
R63
C22
C23
Q8-1
P7
R73
R68
J5
N.C.
ROED
DCB
ACBTP
+24R
0R
J6
HVTT
HVTP
+24R
0R
HVTPC
HVTTC
+24U
0U
J7
N.C.
HVPON
HVPON
HVSCT
HVSON
HV GND
+24R
0R
J8
+24U
0U
+24R
+5
0R
C28
C29
C30
C31
+5V
P5
J3
+24R
N.C.
POT
GND
+24v
EPC SENS
R74
R75
R76
C27
R78
R79
VR1
R80
Q8-2
ZD1
R81
R82
R83
P1
C34
J4

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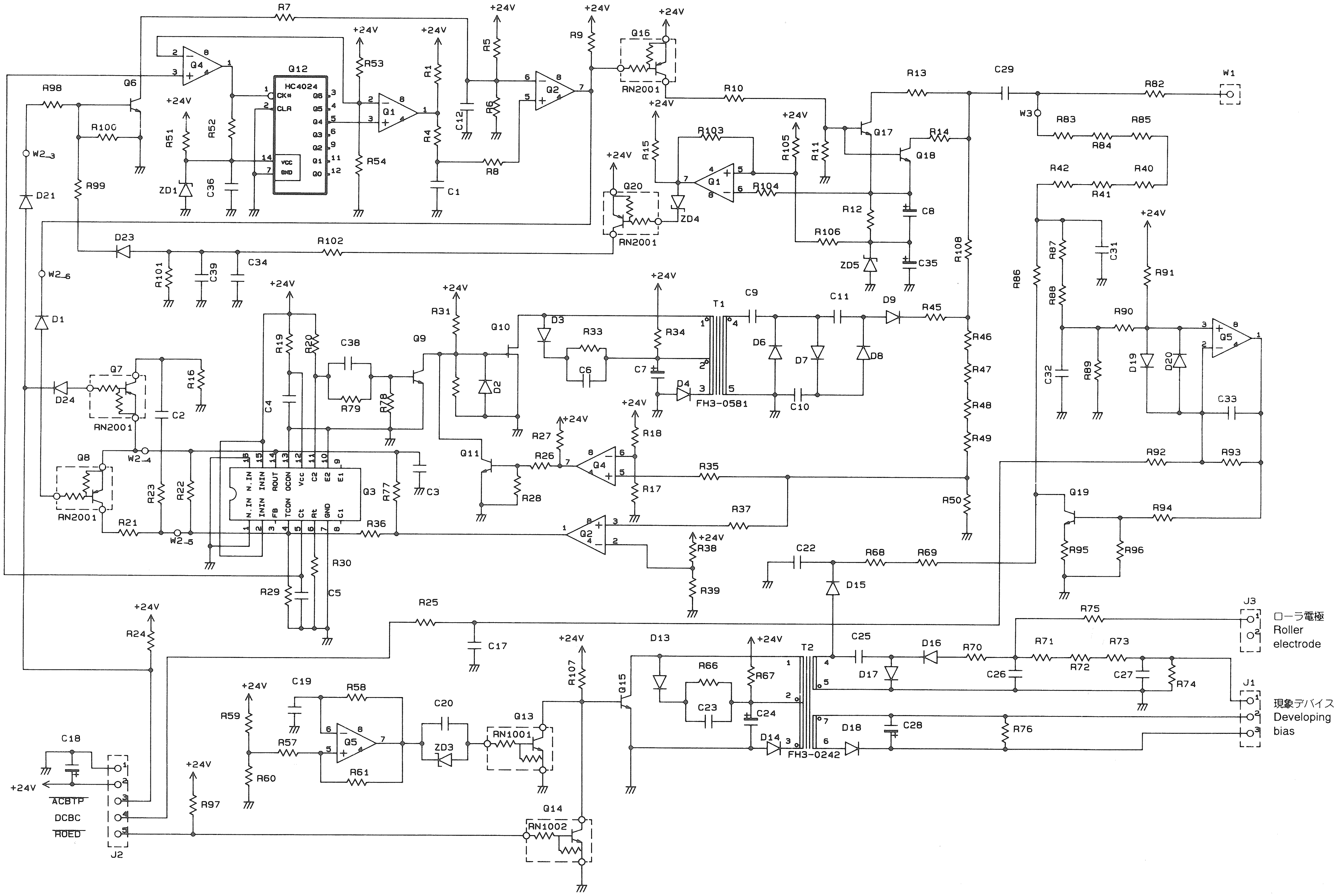
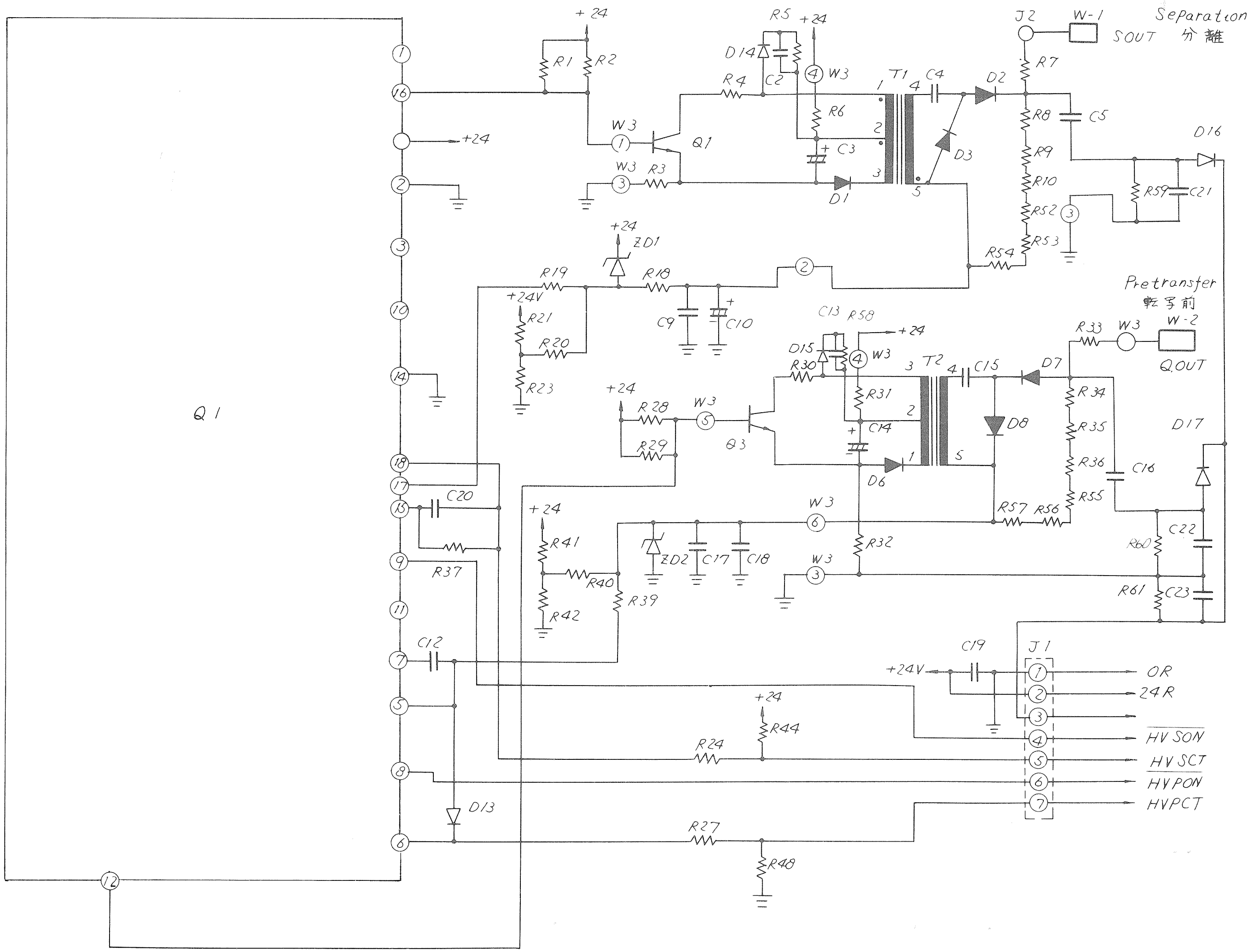
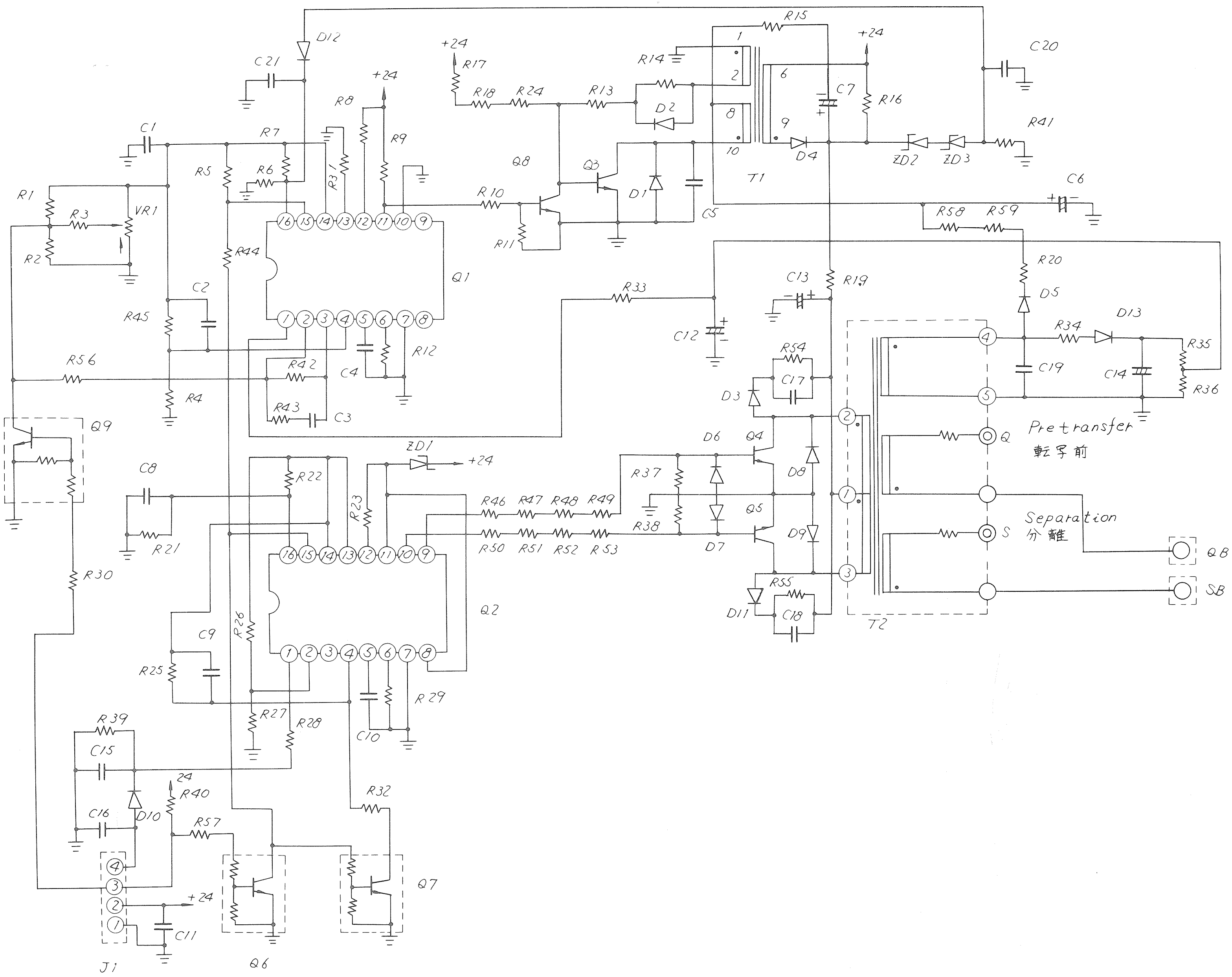
J. HIGH-VOLTAGE TRANSFORMER 2 CIRCUIT DIAGRAM


R7
+24V
Q4
Q12
HC4024
CK*
CLR
Q6
Q5
Q4
Q3
Q2
Q1
Q0
VCC
GND
R53
R54
Q1
R1
R4
C1
C12
R5
R6
R8
Q2
R9
Q16
RN2001
R10
R13
C29
R82
W1
W3
R83
R84
R85
R42
R41
R40
R98
R100
R99
W2_3
D21
R51
ZD1
R52
C36
Q20
ZD4
R15
R103
R104
R105
R11
Q17
Q18
R14
R12
C8
R106
ZD5
C35
R108
D23
R102
R101
C39
C34
W2_6
D1
R19
R20
C4
C38
R79
R78
Q9
R31
Q10
D2
D3
R33
C6
R34
C7
D4
T1
FH3-0581
C9
C11
D6
D7
D8
C10
D9
R45
R46
R47
R48
R49
R50
R86
R87
R88
C31
C32
R89
R90
R91
D19
D20
Q5
C33
Q7
RN2001
D24
R16
C2
Q8
W2_4
R23
R22
R21
W2_5
Q3
N.IN
ININ
ROUT
OCON
Vcc
C2
E2
E1
FB
TCON
Ct
Rt
GND
C1
R77
C3
R36
R30
R29
C5
Q11
R26
R27
R28
R18
R17
R35
R37
R38
R39
R92
R93
Q19
R94
R95
R96
C22
R68
R69
D15
R25
C17
R24
R75
J3
ローラ電極
Roller
electrode
D13
R66
C23
R67
C24
D14
T2
FH3-0242
C25
D16
D17
R70
C26
R71
R72
R73
C27
R74
D18
C28
R76
J1
現象デバイス
Developing
bias
R107
Q15
C19
R58
R59
R57
R60
R61
C20
ZD3
Q13
RN1001
Q14
RN1002
R97
C18
ACBTP
DCBC
HOED
J2

K. HIGH-VOLTAGE AC CONTROLLER CIRCUIT DIAGRAM

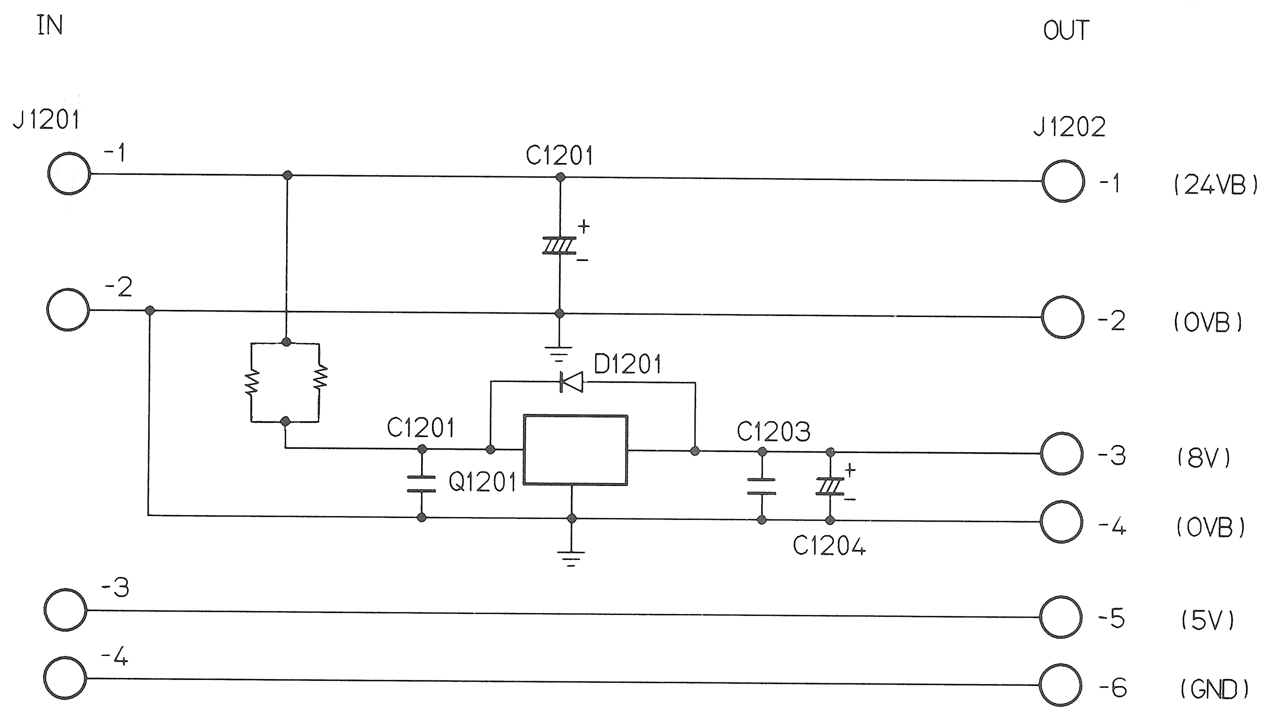

Q1
+24
R1
R2
R5
D14
C2
R4
W3
R6
T1
C4
C3
D1
D3
D2
J2
W-1
SOUT
Separation
分離
R7
R8
C5
R9
R10
R52
R53
R54
D16
R59
C21
Q1
R3
+24V
ZD1
R19
R18
R21
R20
R23
C9
C10
Pretransfer
転写前
W-2
QOUT
R33
D7
C13
R58
D15
R30
R31
C14
T2
C15
D8
D6
Q3
R28
R29
R34
R35
R36
C16
R55
R56
R57
D17
C22
R60
R61
C23
C20
R37
R41
R40
R42
R39
ZD2
C17
C18
R32
C12
C19
J1
OR
24R
HV SON
HV SCT
HV PON
HVPCT
R44
R24
R27
R48
D13

L AC TRANSFORMER CIRCUIT DIAGRAM

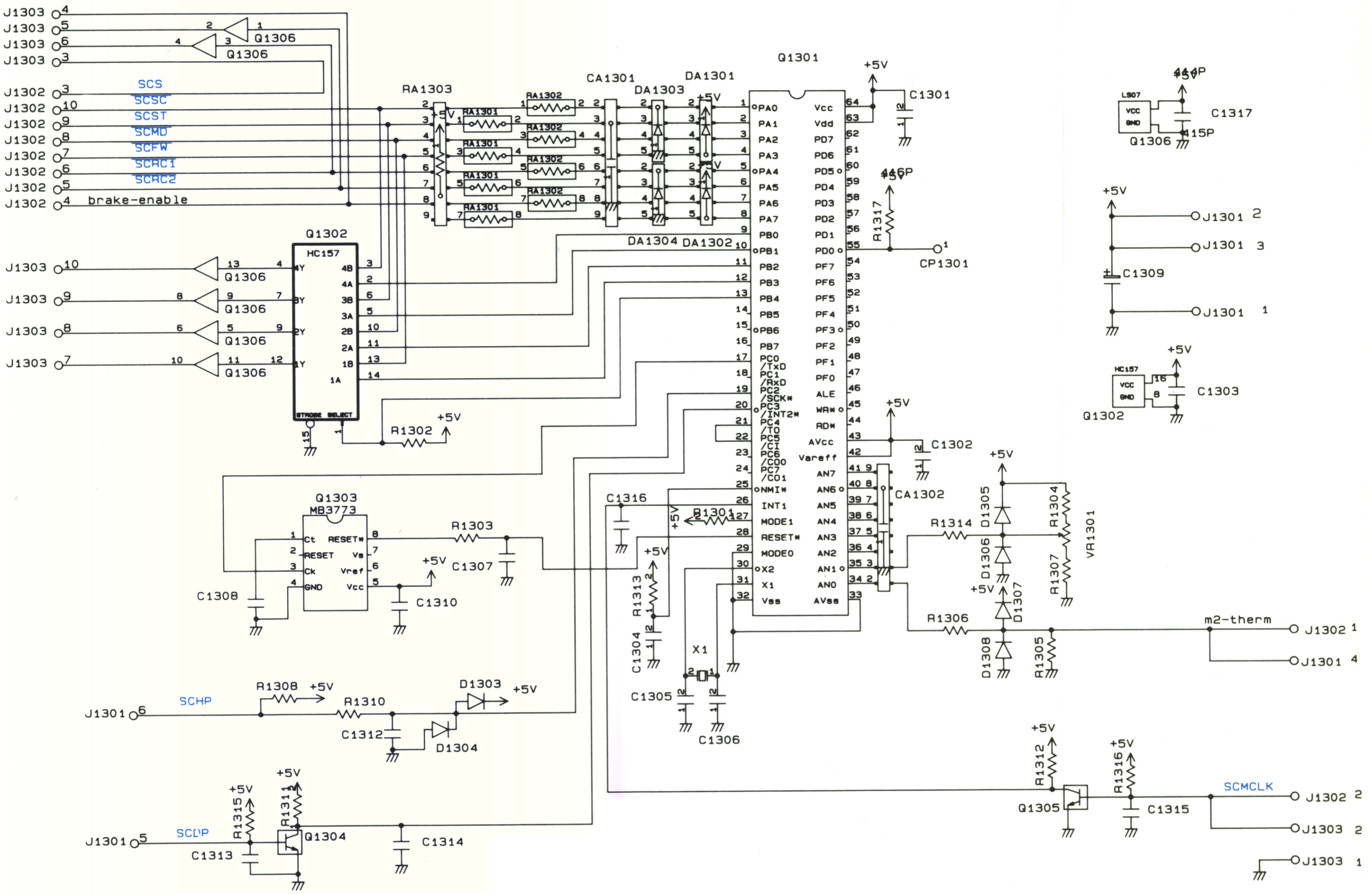


D12
C21
C1
R7
R5
R6
R1
R3
VR1
R2
R44
C2
R45
R56
R4
R42
R43
C3
C4
R12
Q1
R8
+24
R31
R9
+24
R17
R18
R24
R13
R10
R11
Q8
Q3
D1
C5
D2
R14
R15
1
2
8
10
6
9
T1
C7
+24
R16
D4
ZD2
ZD3
C20
R41
C6
R58
R59
R20
D5
R33
C13
R19
C12
R54
C17
D3
D6
Q4
D8
R37
R38
Q5
D7
D9
R55
C18
D11
T2
2
1
3
4
5
Q
S
R34
D13
C19
C14
R35
R36
Pretransfer
転写前
Separation
分離
QB
SB
Q9
C8
R21
R22
ZD1
+24
R23
R46
R47
R48
R49
R50
R51
R52
R53
Q2
R26
C9
R25
R27
R28
C10
R29
R30
R39
C15
D10
C16
24
R40
R57
R32
Q6
Q7
J1
4
3
2
1
+24
C11

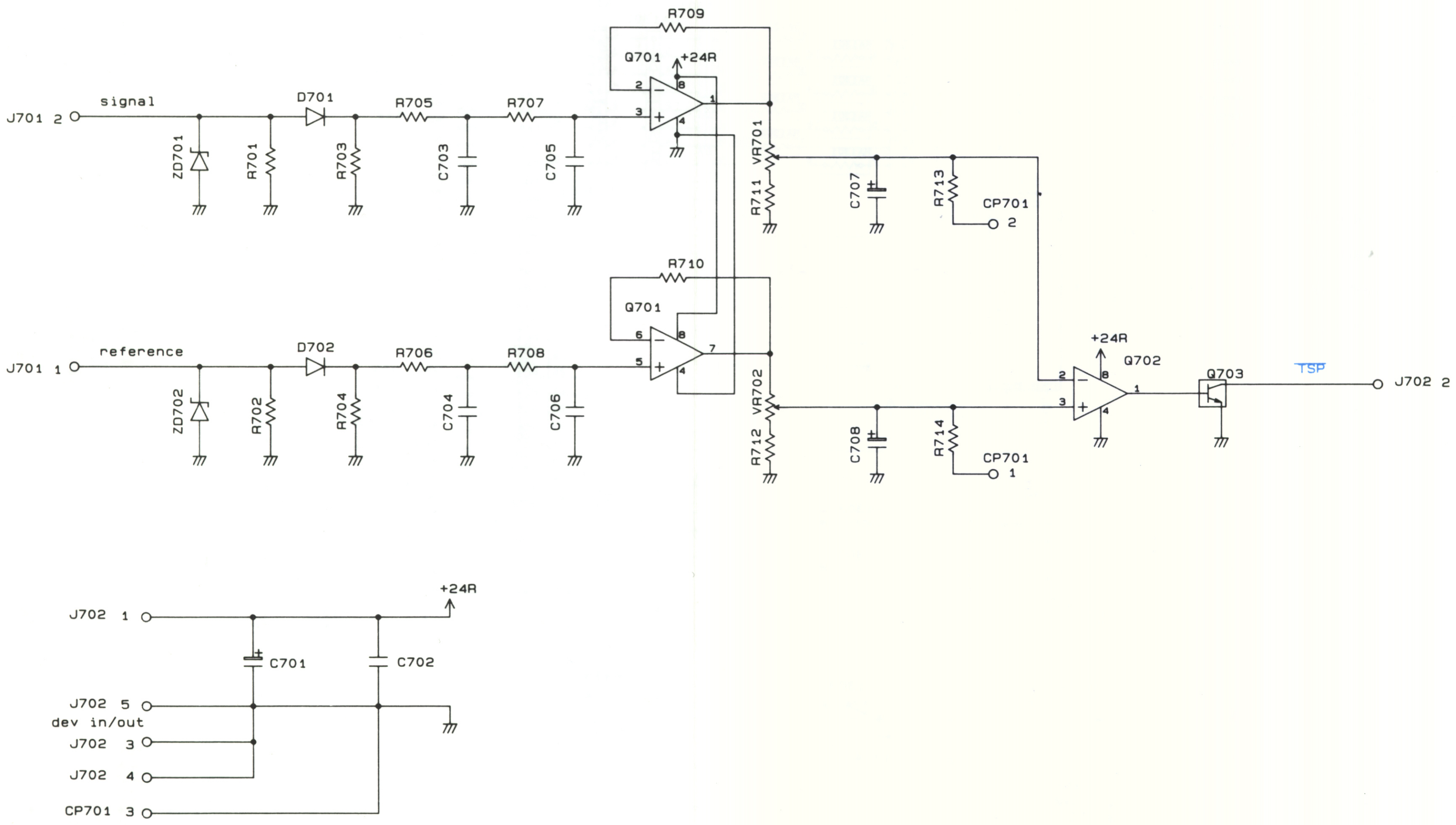
M. M2 POWER SUPPLY CIRCUIT DIAGRAM


IN
OUT
J1201
J1202
-1
-2
-3
-4
C1201
C1201
Q1201
D1201
C1203
C1204
-1
(24VB)
-2
(0VB)
-3
(8V)
-4
(0VB)
-5
(5V)
-6
(GND)

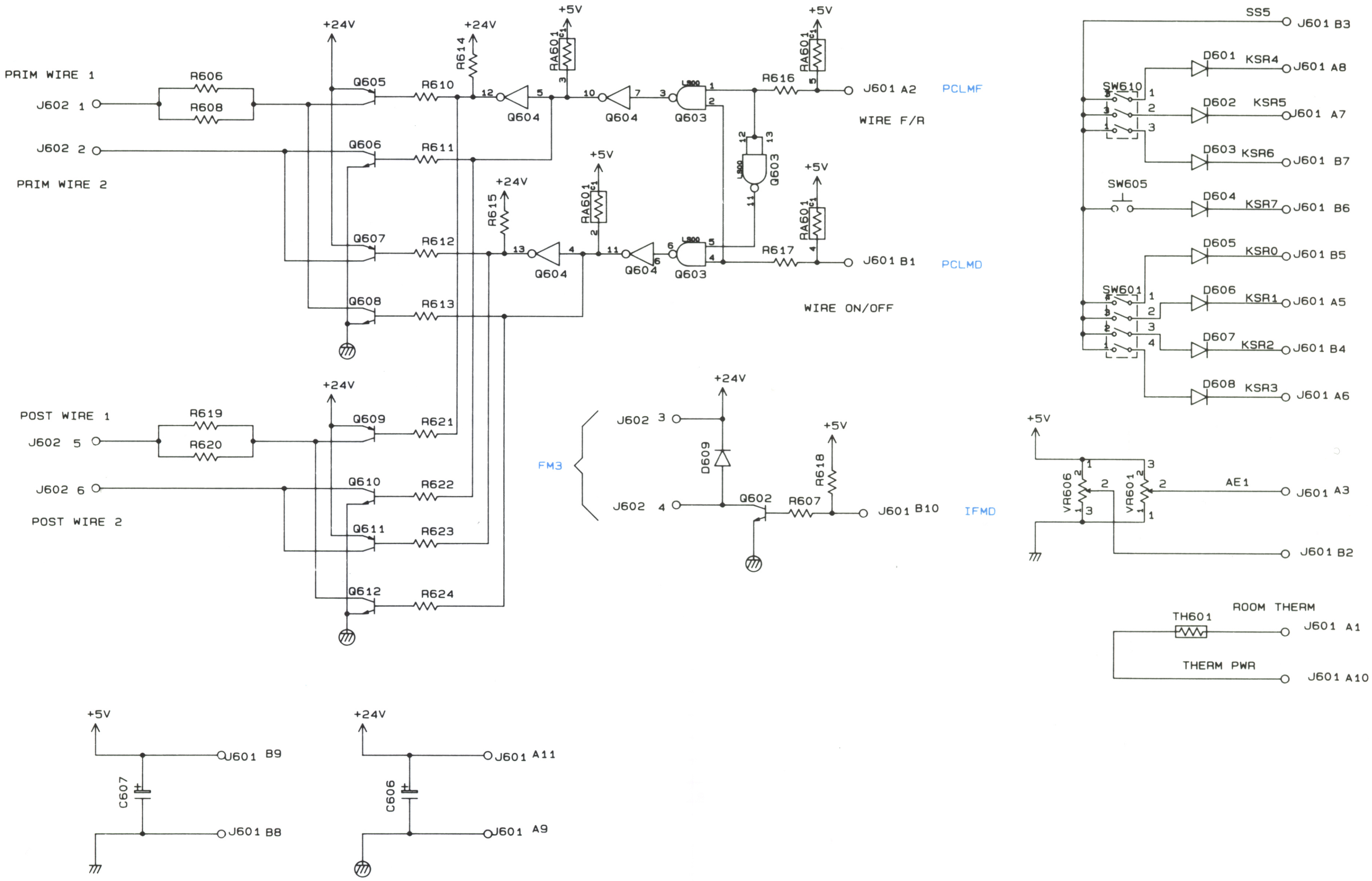
N. M2 BRAKE CONTROLLER CIRCUIT DIAGRAM


J1303 4
J1303 5
J1303 6
J1303 3
J1302 3
J1302 10
J1302 9
J1302 8
J1302 7
J1302 6
J1302 5
J1302 4
SCS
SCSC
SCST
SCMD
SCFW
SCRC1
SCRC2
brake-enable
Q1306
Q1302
HC157
4Y
3Y
2Y
1Y
4B
4A
3B
3A
2B
2A
1B
1A
STROBE SELECT
R1302
+5V
J1303 10
J1303 9
J1303 8
J1303 7
RA1303
RA1301
RA1302
CA1301
DA1303
DA1301
DA1304
DA1302
Q1301
PA0
PA1
PA2
PA3
PA4
PA5
PA6
PA7
PB0
PB1
PB2
PB3
PB4
PB5
PB6
PB7
PC0 /TxD
PC1 /RxD
PC2 /SCK*
PC3 /INT2*
PC4 /TO
PC5 /CI
PC6 /CO0
PC7 /CO1
NMI*
INT1
MODE1
RESET*
MODE0
X2
X1
Vss
Vcc
Vdd
PD7
PD6
PD5
PD4
PD3
PD2
PD1
PD0
PF7
PF6
PF5
PF4
PF3
PF2
PF1
PF0
ALE
WR*
RD*
AVcc
Vareff
AN7
AN6
AN5
AN4
AN3
AN2
AN1
AN0
AVss
C1301
C1302
R1317
44P
CP1301
CA1302
R1314
R1304
VR1301
D1305
D1306
D1307
D1308
R1307
R1306
R1305
m2-therm
J1302 1
J1301 4
Q1303
MB3773
Ct
RESET*
RESET
Vs
Ck
Vref
GND
Vcc
R1303
C1307
C1308
C1310
C1316
R1301
R1313
C1304
X1
C1305
C1306
SCHP
J1301 6
R1308
R1310
C1312
D1303
D1304
SCLP
J1301 5
R1315
R1311
C1313
Q1304
C1314
R1312
R1316
Q1305
C1315
SCMCLK
J1302 2
J1303 2
J1303 1
LS07
GND
C1317
15P
C1309
J1301 2
J1301 3
J1301 1
C1303

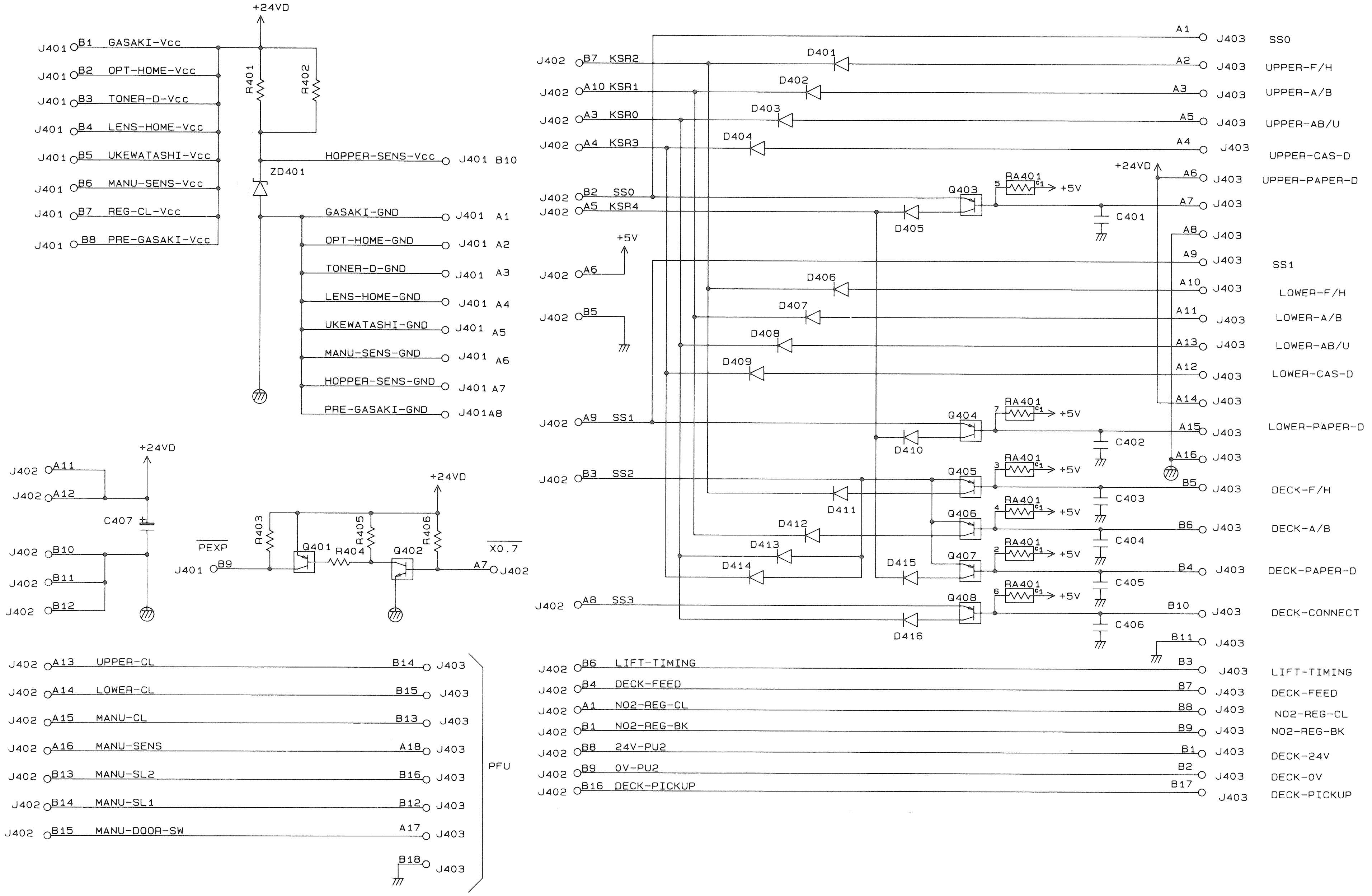
O. TONER LEVEL SENSOR CIRCUIT DIAGRAM


J701 2
signal
ZD701
R701
D701
R703
R705
C703
R707
C705
R709
Q701
+24R
2
3
8
4
1
VR701
R711
C707
R713
CP701 2
J701 1
reference
ZD702
R702
D702
R704
R706
C704
R708
C706
R710
Q701
6
5
8
4
7
VR702
R712
C708
R714
CP701 1
+24R
Q702
2
3
8
4
1
Q703
TSP
J702 2
J702 1
+24R
C701
C702
J702 5
dev in/out
J702 3
J702 4
CP701 3

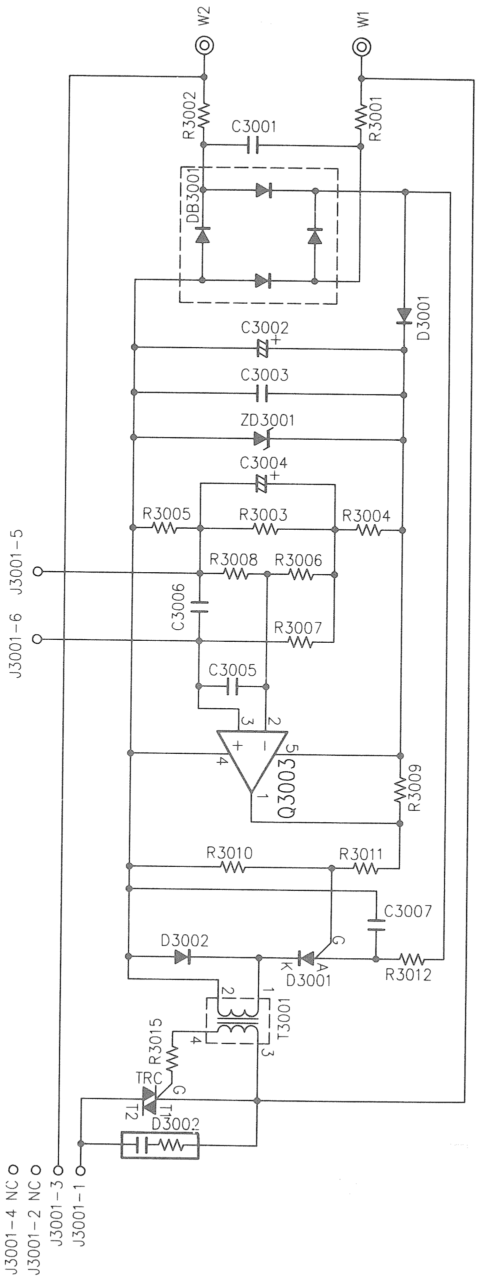
P. SW/VR CIRCUIT DIAGRAM


PRIM WIRE 1
J602 1
J602 2
PRIM WIRE 2
R606
R608
+24V
Q605
Q606
Q607
Q608
R610
R611
R612
R613
R614
+24V
R615
+24V
Q604
12
5
10
7
13
4
11
6
RA601
3
2
+5V
Q604
Q603
LS00
1
2
3
5
4
6
Q603
12
13
11
R616
R617
RA601
5
4
+5V
J601 A2
J601 B1
PCLMF
PCLMD
WIRE F/R
WIRE ON/OFF
POST WIRE 1
J602 5
J602 6
POST WIRE 2
R619
R620
+24V
Q609
Q610
Q611
Q612
R621
R622
R623
R624
FM3
J602 3
J602 4
+24V
D609
Q602
R607
R618
+5V
J601 B10
IFMD
+5V
C607
J601 B9
J601 B8
+24V
C606
J601 A11
J601 A9
SS5
J601 B3
SW610
1
2
3
D601
KSR4
J601 A8
D602
KSR5
J601 A7
D603
KSR6
J601 B7
SW605
D604
KSR7
J601 B6
SW601
1
2
3
4
D605
KSR0
J601 B5
D606
KSR1
J601 A5
D607
KSR2
J601 B4
D608
KSR3
J601 A6
+5V
VR606
VR601
1
2
3
AE1
J601 A3
J601 B2
ROOM THERM
TH601
J601 A1
THERM PWR
J601 A10

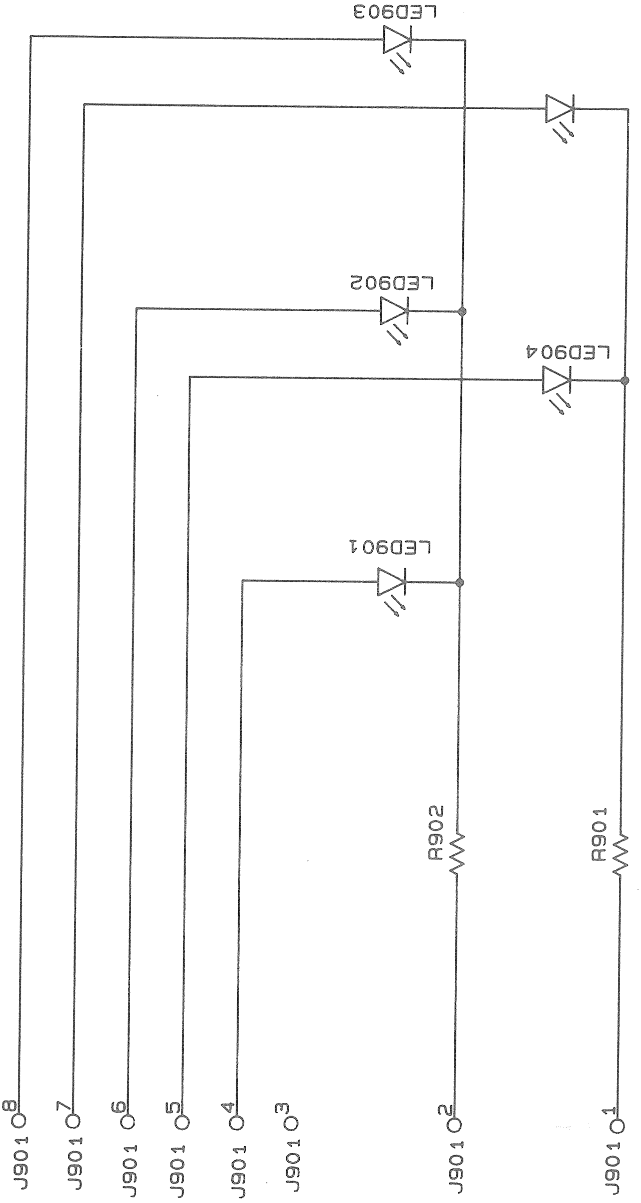
Q. CONNECTOR CIRCUIT DIAGRAM


+24VD
J401 B1 GASAKI-Vcc
J401 B2 OPT-HOME-Vcc
J401 B3 TONER-D-Vcc
J401 B4 LENS-HOME-Vcc
J401 B5 UKEWATASHI-Vcc
J401 B6 MANU-SENS-Vcc
J401 B7 REG-CL-Vcc
J401 B8 PRE-GASAKI-Vcc
R401
R402
ZD401
HOPPER-SENS-Vcc J401 B10
GASAKI-GND J401 A1
OPT-HOME-GND J401 A2
TONER-D-GND J401 A3
LENS-HOME-GND J401 A4
UKEWATASHI-GND J401 A5
MANU-SENS-GND J401 A6
HOPPER-SENS-GND J401 A7
PRE-GASAKI-GND J401A8
J402 A11
J402 A12
J402 B10
J402 B11
J402 B12
C407
PEXP
J401 B9
R403
Q401
R404
R405
Q402
R406
X0.7
A7 J402
J402 A13 UPPER-CL B14 J403
J402 A14 LOWER-CL B15 J403
J402 A15 MANU-CL B13 J403
J402 A16 MANU-SENS A18 J403
J402 B13 MANU-SL2 B16 J403
J402 B14 MANU-SL1 B12 J403
J402 B15 MANU-DOOR-SW A17 J403
B18 J403
PFU
J402 B7 KSR2
J402 A10 KSR1
J402 A3 KSR0
J402 A4 KSR3
J402 B2 SS0
J402 A5 KSR4
+5V
J402 A6
J402 B5
J402 A9 SS1
J402 B3 SS2
J402 A8 SS3
D401
D402
D403
D404
D405
D406
D407
D408
D409
D410
D411
D412
D413
D414
D415
D416
Q403
Q404
Q405
Q406
Q407
Q408
RA401
C401
C402
C403
C404
C405
C406
A1 J403 SS0
A2 J403 UPPER-F/H
A3 J403 UPPER-A/B
A5 J403 UPPER-AB/U
A4 J403 UPPER-CAS-D
A6 J403 UPPER-PAPER-D
A7 J403
A8 J403
A9 J403 SS1
A10 J403 LOWER-F/H
A11 J403 LOWER-A/B
A13 J403 LOWER-AB/U
A12 J403 LOWER-CAS-D
A14 J403
A15 J403 LOWER-PAPER-D
A16 J403
B5 J403 DECK-F/H
B6 J403 DECK-A/B
B4 J403 DECK-PAPER-D
B10 J403 DECK-CONNECT
B11 J403
J402 B6 LIFT-TIMING B3 J403 LIFT-TIMING
J402 B4 DECK-FEED B7 J403 DECK-FEED
J402 A1 NO2-REG-CL B8 J403 NO2-REG-CL
J402 B1 NO2-REG-BK B9 J403 NO2-REG-BK
J402 B8 24V-PU2 B1 J403 DECK-24V
J402 B9 0V-PU2 B2 J403 DECK-0V
J402 B16 DECK-PICKUP B17 J403 DECK-PICKUP

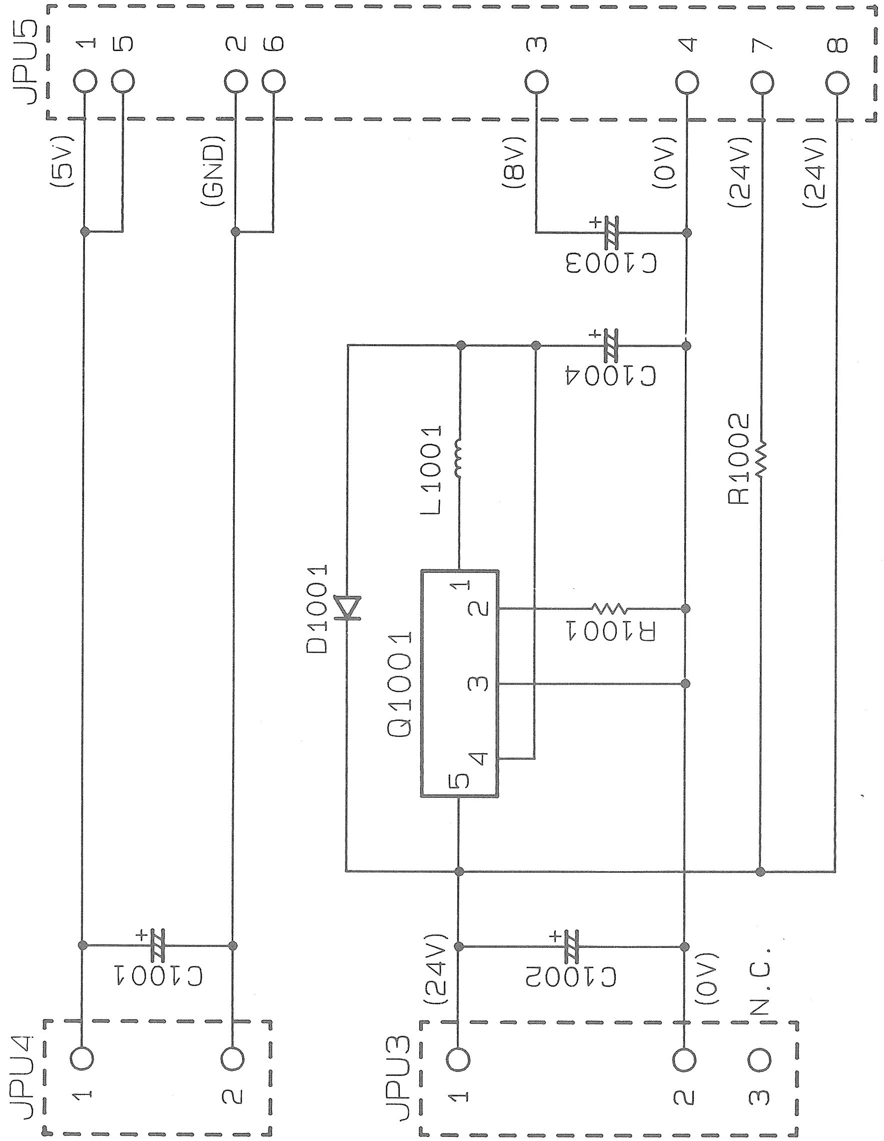
R. DRUM HEATER CONTROL CIRCUIT DIAGRAM


W2
W1
R3002
R3001
C3001
DB3001
D3001
C3002
C3003
ZD3001
C3004
R3005
R3003
R3004
J3001-5
J3001-6
R3008
R3006
C3006
R3007
C3005
Q3003
R3009
R3010
R3011
C3007
D3002
D3001
R3012
T3001
R3015
TRC
G
T1
T2
D3002
J3001-4 NC
J3001-2 NC
J3001-3
J3001-1

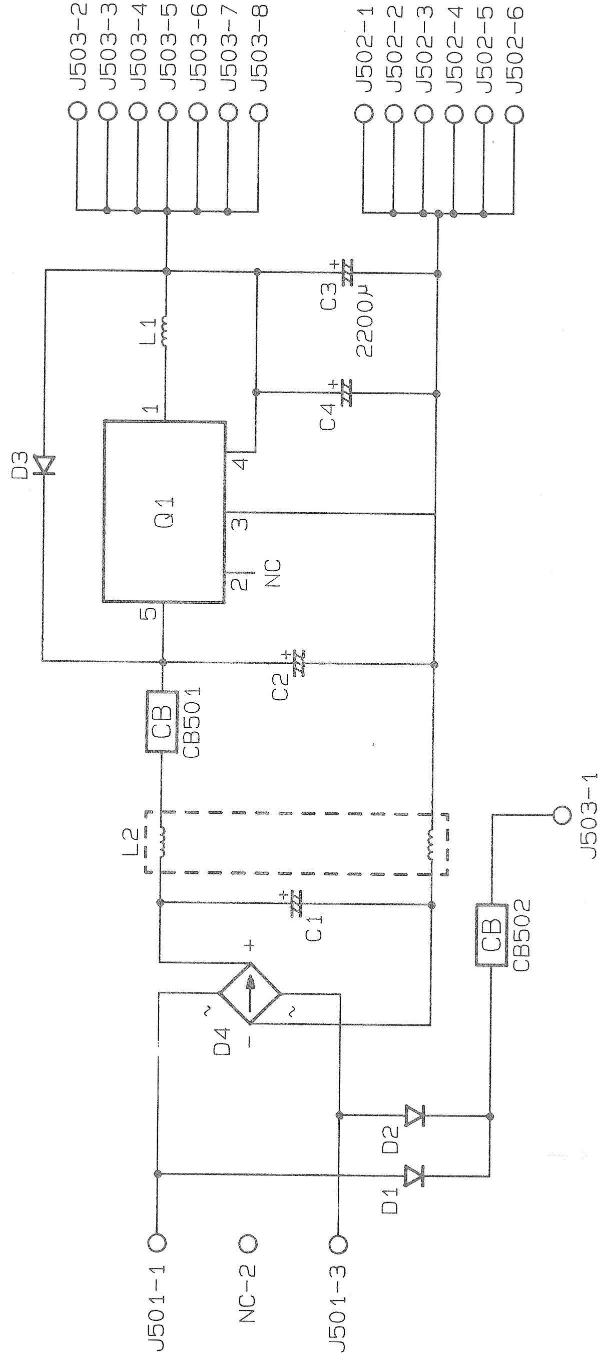
S. JAM INDICATOR CIRCUIT DIAGRAM

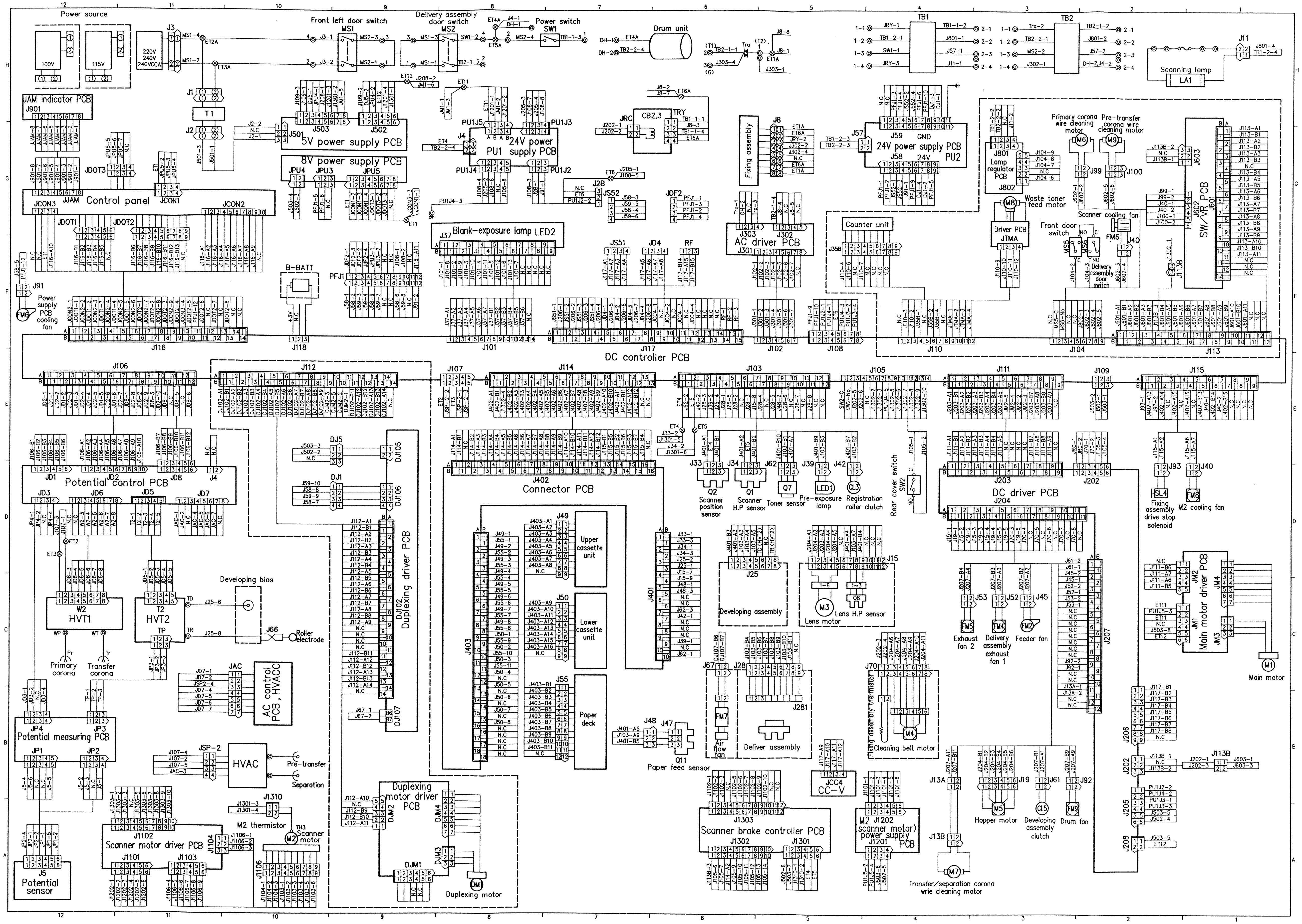

LED903
LED902
LED904
LED901
R902
R901
J901 8
J901 7
J901 6
J901 5
J901 4
J901 3
J901 2
J901 1

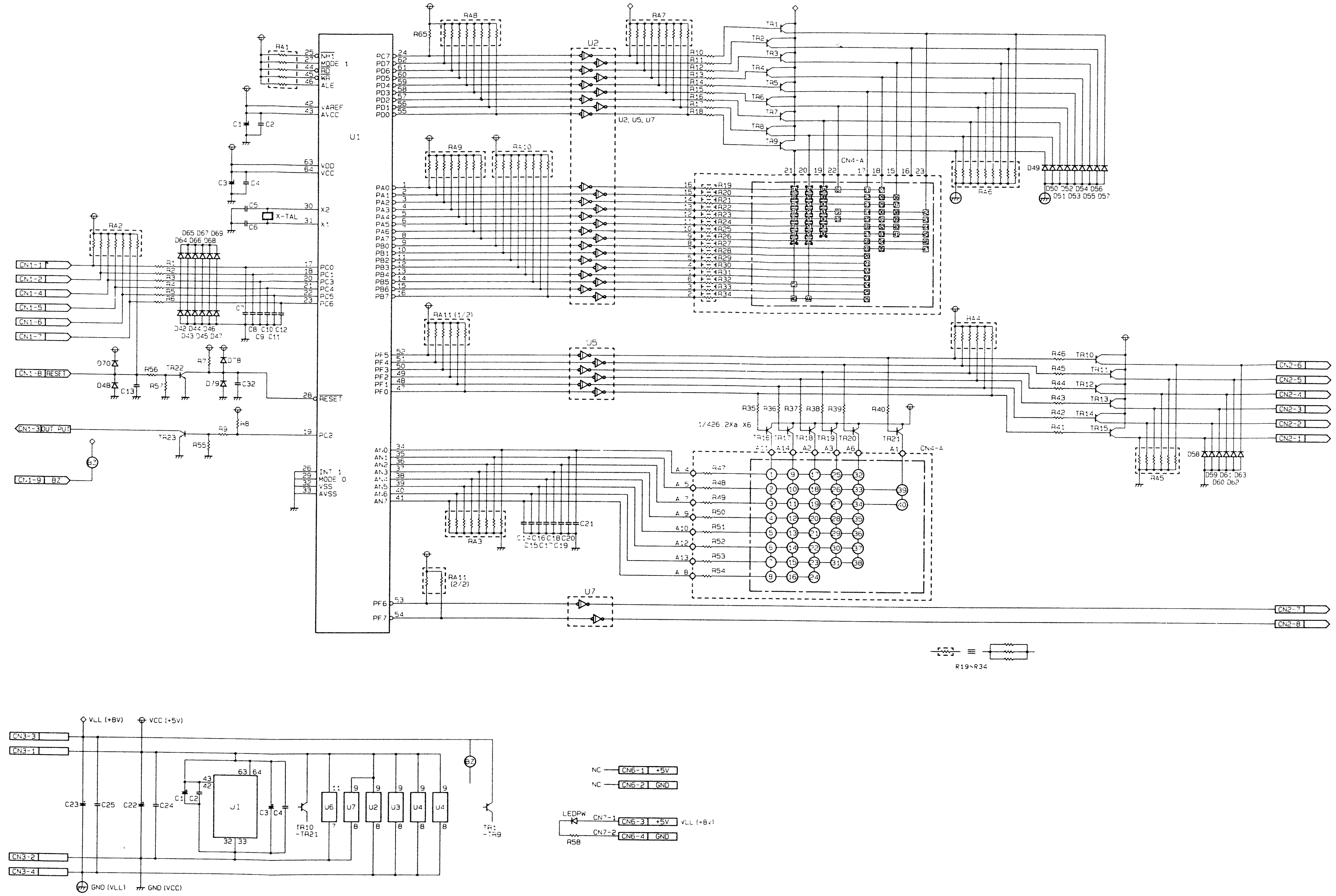
T. 8V POWER SUPPLY CIRCUIT DIAGRAM


JPU5
1
5
2
6
3
4
7
8
(5V)
(GND)
(8V)
(0V)
(24V)
(24V)
C1003
C1004
L1001
R1002
D1001
Q1001
1
2
3
4
5
R1001
C1001
C1002
(24V)
(0V)
N.C.
JPU4
1
2
JPU3
1
2
3

U. 5V POWER SUPPLY CIRCUIT DIAGRAM

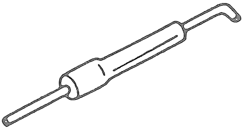
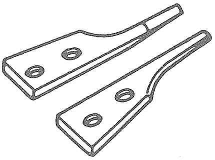
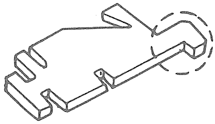

J503-2
J503-3
J503-4
J503-5
J503-6
J503-7
J503-8
J502-1
J502-2
J502-3
J502-4
J502-5
J502-6
C3
2200μ
L1
C4
D3
Q1
1
4
3
2
NC
5
C2
CB
CB501
L2
J503-1
C1
CB
CB502
+
~
~
D4
-
D2
D1
J501-1
NC-2
J501-3


Power source
100V
115V
220V 240V 240VCCA
Front left door switch
MS1
Delivery assembly door switch
MS2
Power switch
SW1
Drum unit
TB1
TB2
Scanning lamp
LA1
JAM indicator PCB
Control panel
5V power supply PCB
8V power supply PCB
24V power supply PCB PU1
Blank-exposure lamp LED2
B-BATT
Fixing assembly
AC driver PCB
24V power supply PCB PU2
Counter unit
Lamp regulator PCB
Primary corona wire cleaning motor
Pre-transfer corona wire cleaning motor
Waste toner feed motor
Driver PCB JTMA
Front door switch
Delivery assembly door switch
Scanner cooling fan
SW/VR PCB
Power supply PCB cooling fan
DC controller PCB
Potential control PCB
HVT1
HVT2
Developing bias
Roller electrode
Primary corona
Transfer corona
AC control PCB, HVACC
Potential measuring PCB
HVAC
Pre-transfer
Separation
M2 thermistor
Scanner motor
Scanner motor driver PCB
Potential sensor
Duplexing driver PCB
Duplexing motor driver PCB
Duplexing motor
Connector PCB
Upper cassette unit
Lower cassette unit
Paper deck
Paper feed sensor
Scanner position sensor
Scanner H.P sensor
Toner sensor
Pre-exposure lamp
Registration roller clutch
Rear cover switch
Developing assembly
Lens motor
Lens H.P sensor
Air flow fan
Deliver assembly
Fixing assembly thermistor
Cleaning belt motor
CC-V
Scanner brake controller PCB
M2 (scanner motor) power supply PCB
DC driver PCB
Exhaust fan 2
Delivery assembly exhaust fan 1
Feeder fan
Hopper motor
Developing assembly clutch
Drum fan
Transfer/separation corona wrie cleaning motor
Fixing assembly drive stop solenoid
M2 cooling fan
Main motor driver PCB
Main motor


U1
U2
U5
U7
U2, U5, U7
RA2
RA3
RA7
RA8
RA9
RA10
RA11 (1/2)
RA11 (2/2)
RA41
RA44
RA45
RA46
R65
CN1-1
CN1-2
CN1-4
CN1-5
CN1-6
CN1-7
CN1-8 RESET
CN1-3 OUT PUT
CN1-9 BZ
CN2-1
CN2-2
CN2-3
CN2-4
CN2-5
CN2-6
CN2-7
CN2-8
CN3-1
CN3-2
CN3-3
CN3-4
CN4-A
CN6-1 +5V
CN6-2 GND
CN6-3 +5V
CN6-4 GND
CN7-1
CN7-2
NC
LEDPK
R58
VLL (+8V)
VCC (+5V)
GND (VLL)
GND (VCC)
X-TAL
RESET
PC0
PC1
PC2
PC3
PC4
PC5
PC6
PC7
PD0
PD1
PD2
PD3
PD4
PD5
PD6
PD7
PA0
PA1
PA2
PA3
PA4
PA5
PA6
PA7
PB0
PB1
PB2
PB3
PB4
PB5
PB6
PB7
PF0
PF1
PF2
PF3
PF4
PF5
PF6
PF7
AN0
AN1
AN2
AN3
AN4
AN5
AN6
AN7
VAREF
AVCC
VDD
VCC
X1
X2
INT 1
MODE 0
MODE 1
VSS
AVSS
NMI
ALE
TR1
TR2
TR3
TR4
TR5
TR6
TR7
TR8
TR9
TR10
TR11
TR12
TR13
TR14
TR15
TR16
TR17
TR18
TR19
TR20
TR21
TR22
TR23
TR10 -TR21
TR1 -TR9
R19~R34
1/426 2Xa X6
D49
D50 D52 D54 D56
D51 D53 D55 D57
D58
D59 D61 D63
D60 D62
D64 D66 D68
D65 D67 D69
D42 D44 D46
D43 D45 D47
D48
D70
D78
D79
C1
C2
C3
C4
C5
C6
C7
C8 C10 C12
C9 C11
C13
C14 C16 C18 C20
C15 C17 C19
C21
C22
C23
C24
C25
C32
R8
R9
R10
R11
R12
R13
R14
R15
R16
R18
R35
R36
R37
R38
R39
R40
R41
R42
R43
R44
R45
R46
R47
R48
R49
R50
R51
R52
R53
R54
R55
R56
R57
U3
U4
U6

X. SPECIAL PURPOSE TOOLS

The following table shows special tools not included in the standard tool set, but are necessary when servicing this machine.

No.	Tool name	Tool number	Shape	Rank	Application/Remarks
1	Tension gauge	CK-0054		B	For checking spring tension of cassette 0 to 1500g
2	Stop ring replacement plier tips	CK-0426		B	For removing grip stop 4 to 9mm
3	Door switch retainer	TKN-0093	 Location of use	A	

Y. SOLVENT/OIL TABLE

No.	Name	Application	Composition	Remarks
1	Alcohol	Cleaning; e.g., glass, plastic, rubber; external covers	Fluorine-based hydrocarbon, alcohols, surface activator, water	IPA (isopropy alcohol) • Do not bring near fire. • Procure locally.
2	MEK	Cleaning; e.g., metal portions; oil smudges, toner smudges.	Mineral oil-based hydrocarbons, chlorine-based hydrocarbon, alcohols	MEK • Do not bring near fire. • Procure locally.
3	Heat resistant grease	Drive portion	Mineral oil-based lithium soap Molybdenum disulfide	• Vitasol MO-138S (Manufactured by Hitachi Powered Metal) • Tool No. CK-0427 (500g/can)
4	Lubricant	Optical system rail	Mineral oil (paraffin-based)	Uniway 68 (TKN-0451) (manufactured by Nihon Sekiyu) • Substitutes Suwaway S68 (manufactured by Maruzen Sekiyu) Mobil Vactra Oil No.2 (manufactured by Mobil Oil)

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